



Cumulus Consultants Ltd

**High Nature Value farmland in
Rural Development policy**

Blackdown Hills Case Study

Report for

**European Forum on Nature Conservation
and Pastoralism**

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Report Prepared for

European Forum on Nature Conservation and Pastoralism

Report prepared by: Paul Silcock
 Gavin Saunders
 Martin Turner

Report reviewed by: Paul Silcock

Cumulus Consultants Ltd,
The Palmers, Wormington Grange,
Wormington, Broadway,
Worcestershire. WR12 7NJ

Telephone: +44 (0)1386 584950
Email: info@cumulus-consultants.co.uk
Internet: <http://www.cumulus-consultants.co.uk>

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Glossary

AES	Agri-Environment Scheme
AONB	Area of Outstanding Natural Beauty
BAP	Biodiversity Action Plan
CAP	Common Agricultural Policy
CSS	Countryside Stewardship Scheme
CWS	County Wildlife Site
DWT	Devon Wildlife Trust
ELS	Entry Level Stewardship
EENRD	European Evaluation Network for Rural Development
ESA	Environmentally Sensitive Area
EU	European Union
FBI	Farm Business Income
FBS	Farm Business Survey
FWAG	Farming and Wildlife Advisory Group
HAT	Holding Assessment Toolkit
HLS	Higher Level Stewardship
HNV	High Nature Value
HNVF	High Nature Value Farmland
JCA	Joint Character Area
LCT	Landscape Character Type
NE	Natural England
OELS	Organic Entry Level Stewardship
RDPE	Rural Development Programme for England
RIGS	Regionally Important Geological Site
RLR	Rural Land Register
SAC	Special Area of Conservation
SNA	Strategic Nature Area
SPS	Single Payment Scheme
SSSI	Site of Special Scientific Interest

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Introduction

This case study is part of Phase 2 of the Devon High Nature Value (HNV) farming project. It is one of four case studies¹ that build on the work carried out in Phase 1 (see main report).

In Phase 1 the project aimed to clarify what is HNV farmland, where it is, and how much there is, in the case study areas. The project explored what data and methods can be used to identify this farmland, and its approximate location and extent, in the case study areas.

This was not intended to be a precise scientific exercise. Rather it was a process of trial and error, to see what can be done to identify broad areas of HNV farmland initially using nationally available data sources. Local data were to be used only where necessary. However, a strong input of local knowledge is needed for ground-truthing the assumptions used and the data available at national level.

The Phase 1 work considered different approaches to identifying HNV farmland, based on experience at national and EU levels and on the guidance produced by the European Evaluation Network for Rural Development Help Desk. These can be summarised as:

- The land-cover approach (identifying types and patterns of land cover that can be expected to support HNV).
- The habitats and species approach (mapping the location of concentrations of habitats and/or species of conservation concern).
- The farming systems approach (identifying and mapping farm types than have characteristics normally associated with HNV, such as low livestock densities).

The project partners concluded that these approaches, using existing databases, do not allow a sufficiently robust identification of HNV farmland in the Devon case study areas, for various reasons:

- Landcover UK 2000 is not produced at sufficiently high resolution; the 2007 version is much higher resolution but is not yet available.
- Habitat inventories include only Biodiversity Action Plan (BAP) priority habitats (there is a consensus among the project partners that such inventories do not represent the total extent of semi-natural farmland in its wider sense), and the data are often quite old.
- Species data are not sufficiently consistent either geographically or across taxa, and the spatial resolution is also too crude in most cases.
- Data on farming characteristics are not readily available at a sufficient spatial resolution and would need to be tested against an initial interpretation of which areas of farmland can be considered HNV on ecological grounds.

The project therefore turned to aerial photos to see if these would allow the identification of a wider spectrum of semi-natural farmland. The answer seems to be that they do, as the unimproved and semi-improved farmland has a distinct “rough” appearance on the

¹ Blackdown Hills, South Devon, Culm, Dartmoor

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photos. Local knowledge confirmed that the areas apparent from this visual interpretation of the photos correspond with farmland areas considered of most nature value. It was noted also that these semi-improved habitats linked many of the BAP priority habitat areas and/or were located in the same landscape units.

The project partners decided to produce indicative maps of HNV farmland for the case study areas on the basis of visual interpretation of aerial photos. These indicative maps aim to capture a contiguous area of HNV farmland for each case-study area. More details on the characteristics for the case study area are presented in this report.

Phase 1 was successful in establishing for the case study areas a “baseline” of HNV farmland, as intended under the EU indicator for monitoring rural development programmes.

Under the Phase 2 case studies, the project analysed the characteristics of farming on the HNV “baseline” area, the tendencies and needs of this farming from the perspective of maintaining nature values, and the effectiveness of current policies.

Thus the aim of Phase 2 was to address the following questions in each case study area:

- Can we characterise the different farming systems or farm types that currently support HNV farmland (e.g. in terms of production sector, production systems, management practices, farm size, ownership, etc.)?
- How are these farming systems or types likely to evolve in future e.g. intensification, abandonment, change of land use?
- What are the main factors influential in maintaining HNV farmland e.g. policy and socio-economic trends but also e.g. hobby farmers, tourism, personal motivation of certain farmers?
- What are the key issues that need to be addressed on the ground, in order for HNV farmland to be maintained? This includes social and economic questions, but also practical issues such as the availability of livestock to graze small, awkward fields, and how such activities can be organised and continued.
- To what extent does the current package of policy measures ensure the maintenance of HNV farmland e.g. Pillars 1 and 2 of CAP, BAP, NI197 etc.?
- Are current measures effective in maintaining the relevant farming types and practices and their associated nature values? Are the design, coverage, delivery and resources of measures sufficient?

In the final stage (Phase 3 – see main report) the project considered how current policies (especially RDPE) can be improved to ensure that nature values are maintained on farmland within the HNV baseline areas.

1 Farming and Environment in the Blackdown Hills

1.1 Description of the Blackdown Hills Landscape and Environment

The Blackdown Hills Area of Outstanding Natural Beauty (AONB) covers 369 square kilometres (36,860 ha) around the Somerset/Devon border. The Blackdown Hills AONB Management Plan 2009-2014 describes the area as follows:

"From the dramatic, steep wooded north-facing scarp the area dips gently southwards as a flat-topped plateau, deeply dissected by valleys. This is the northern part of the East Devon Plateau – arguably one of the finest, most extensive in Britain. On the tops are open, windswept spaces; in the valleys villages and hamlets nestle among ancient patterns of small, enclosed fields and a maze of winding lanes lined with high hedgebanks. The steep valleys support a patchwork of woodland and heath, nationally and regionally important habitats which support Biodiversity Action Plan species and interesting plant communities."

The Blackdown Hills contain a high concentration of significant wildlife habitat, relative to the lowland farmed landscape of the South West peninsula as a whole. The distribution and character of this habitat is directly correlated with the limitations of the landscape for intensive farming, with the most biodiverse areas being associated with steeper slopes and wetter soils.

The key environmental features of the Blackdown Hills AONB are set out in the Blackdown Hills AONB Management Plan 2009-2014. There are six Landscape Character Types (LCT) in the AONB, these are set out in Table 1-1 together with key farming and environmental characteristics relevant to this study.

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Ref	Landscape Character Type	Key Characteristics
LCT 1A	Open inland planned plateaux	High open plateaux Rectangular field pattern of medium to large scale Well trimmed hedges on narrow earth banks Sparsely settled boundary trees Occasional copses
LCT 1E	Wooded ridges and hilltops	Small hills and associated small ridges, outliers of the plateaux Small to medium irregular fields with spring-line mires Species-rich hedgebanks and tree rows, ancient woodland and great species diversity Mixed woodland and some pasture; hilltop fields may be arable
LCT2A	Steep wooded scarp slopes	Narrow band of steeply sloping land immediately below the plateau edge Mixed woodland and semi-improved or unimproved pasture Pastoral cultivation, with small-scale irregular field pattern Spring-line mires Many patches of semi-natural habitats including spring line mires and scrub
LCT3A	Upper farmed and wooded slopes	Undulating upper valley slopes below the scarp slope Well-treed pastoral farmland, with arable cultivation on lower slopes Small to medium size fields with irregular boundaries Deciduous woods and copses, especially on hilltops and upper slopes Very wide, usually low, species-rich hedges with many hedgerow trees
LCT3B	Lower rolling farmed and settled slopes	Gently rolling landform, sloping up from valley floor Variable size fields with wide, low boundaries and irregular pattern Pastoral land use, often with wooded appearance Many hedgerow trees, copses and streamside tree rows Streams and ditches
LCT4A	Unsettled farmed valley floors	Open flat landform, often with distinct vegetated floodplain edge Shallow watercourses screened by riverside vegetation Hedges, not banks, generally on the boundary with rising land Pastoral land use, with wet meadows and some arable, with variable field sizes

Source: Blackdown Hills AONB Management Plan 2009-2014

Table 1-1: Landscape Character Types and Key Characteristics in the Blackdown Hills AONB

The Blackdown Hills AONB landscape is heavily influenced by historic land use patterns. Enclosed former medieval strip fields are well preserved throughout the AONB and irregular fields and massive hedges in the valleys indicate land taken directly into cultivation from woodland during the medieval period. Ancient woodland, surviving from the medieval period, is still well represented, particularly on the northern escarpment.

This varied and high quality landscape supports a wide diversity of wildlife habitats and associated species. These habitats and characteristic species – including BAP habitats and species - are shown in Table 1-2.

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Habitat	Characteristic Species
<i>Grassland and Heath</i>	
Mire, bog and soak-a-way communities	Great and oblong-leaved sundew, pale butterwort, early marsh-orchid, lesser butterfly orchid , marsh St John's-wort, marsh lousewort, bog-bean; grass snake
Lowland heathland	Bristle bent; nightjar , stonechat, tree pipit ; adder; grayling, dingy skipper , green hairstreak
Unimproved neutral-acid grassland, fen-meadow and rush-pasture (Lowland fens; lowland meadows, purple moor-grass and rush pastures)	Bog myrtle, marsh and meadow thistle; small pearl-bordered fritillary, marsh fritillary ; keeled skimmer; barn owl, curlew, snipe, reed bunting; bats
Calcareous grassland (Lowland meadows; lowland calcareous grassland)	Rockrose, carline thistle, stemless thistle, ploughman's spikenard, pyramidal orchid, yellow-wort, autumn gentian, dyer's greenweed, bee orchid; marsh fritillary, Duke of Burgundy; brown hare
<i>Woodland</i>	
Ash woodland on calcareous soil (Lowland mixed deciduous woodland)	Small-leaved lime, wild service tree, herb-Paris; wood white; marsh tit; dormouse, bats (including noctule); lesser-spotted woodpecker
Oak woodland (Lowland mixed deciduous woodland)	Primrose, bluebell, cow-wheat; wood warbler; dormouse, bats (including lesser horseshoe)
<i>Corridors</i>	
Hedgerows	Primrose, early-purple orchid, green hellebore, black bryony; gatekeeper, brown hairstreak; common lizard; bullfinch; bats (including lesser horseshoe), dormouse, hedgehog
Rivers and streams	Brown trout, bullhead, lamprey; kingfisher, dipper, grey wagtail; otter, water vole, water shrew, bats (including Daubenton's)

Blue text = UK BAP habitats/species or protected through legislation

Source: Blackdown Hills AONB Management Plan 2009-2014

Table 1-2: Key Habitats and Species in the Blackdown Hills AONB

Other BAP species in the AONB include cuckoo, skylark, linnet, yellowhammer, spotted flycatcher, house sparrow, dunnock, starling, song thrush, brown hare, common toad, harvest mouse, Bechstein's bat and brown long-eared bat.

The Blackdown Hills AONB includes the following designations and sites:

- 16 Sites of Special Scientific Interest (SSSI) covering 639.3 ha (just under 2% of the AONB);
- 17.8% of SSSI (by area) in favourable condition and 60% unfavourable recovering (October 2010)
- 1 Special Area of Conservation (SAC), Quants (20.29ha) for marsh fritillary butterfly
- Geological SSSIs (3.47ha); 8 Regionally Important Geological Sites (RIGS)
- 350 County Wildlife Sites (CWS) totalling 3,094 ha (8% of AONB)

The coverage of designated areas as a proportion of the AONB and in terms of farmland (grassland) is shown in Table 1-3.

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	Extent and % of AONB	Approximate extent (% of total designated) that is farmland	Condition
SAC	20.29ha (0.05%)	3 ha (15%)	Unfavourable recovering
SSSI	639ha (1.7%)	447ha (70%)	Favourable – 17.8% Unfavourable recovering – 60.0% Unfavourable no change – 15.1% Unfavourable declining – 7.1%
CWS	3,094ha (8.4%)	Not known	Not known

Table 1-3: Designated land in the Blackdown Hills AONB

1.2 *High Nature Value Farmland in the Blackdown Hills*

HNV farmland (HNVF) in the Blackdown Hills consists of various types of unimproved pasture within a matrix of semi-improved pasture²; there is a lesser amount of improved grassland and arable. The nature value of the farmland is enriched by a network of semi-natural landscape features, such as large hedges and patches of woodland.

This farming landscape is rich in BAP habitats and species. However, elements that do not meet BAP criteria or are not designated (SSSI, CWS) are also an important part of the landscape for wildlife. Many species, such as birds, butterflies and bats, depend partly on the interconnecting areas of farmland. They rely on the tussocky insect-rich grasslands and fields of winter stubbles for feeding (not common in the area), scrubby corners and farm ponds that all form part of the HNVF matrix within the Blackdown Hills. Hedges are important for bat flight lines, semi-improved rough grassland (not necessarily botanically rich) provides valuable foraging habitat for bats and Barn owls.

The broad types of semi-natural farmland (grassland and heath) present in the Blackdown Hills are shown in Table 1-2, along with other semi-natural habitats (hedgerows, woodland and streams) typical of the landscape. The characteristic species of these habitats are shown in the table.

The condition of the “other” farmland within which the semi-natural land sits is a critical consideration – for example, an area of semi-improved grassland surrounding or adjacent to semi-natural grassland can act as a buffer from nitrogen and biocides, as well as allowing colonisation from the semi-natural seed sources. A field of maize, for example, does not provide these benefits. The semi-improved pastures in the Blackdown Hills cover a range of situations as explained in Table 1-5.

Factors such as the size and coverage of semi-natural patches, and the distance between them, are ecologically important. These and other factors (e.g. management factors) are summarised in Table 1-5. A quantitative analysis of factors and thresholds (e.g. how much semi-natural farmland is needed in the landscape, what density of hedges, etc.) was not possible under the present study.

The indicative map of HNV farmland and woodland produced under this study for the Blackdown Hills aims to capture a contiguous area of landscape that is made up mainly

² Unimproved pasture consists of vegetation that has not been reseeded of artificially fertilised, or sufficient time has passed since this was done to allow reversion to a “semi-natural” community. Semi-improved pasture is in altered state due to past reseeding and/or fertilisation, but not to the extreme of grassland that is under intensive management.

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of unimproved and semi-improved pasture, and which also has a high presence of features such as hedges and woods.

The HNV farmland area corresponds with the poorer, wetter agricultural land, and steeper slopes (almost entirely Grade 4 and 5 Agricultural Land Classification). In agricultural terms, it is primarily permanent pasture and rough grazing (the latter is a relatively limited land use in Blackdown Hills).

The HNV woodland corresponds with semi-natural woodland.

The HNV “baseline” area for the Blackdown Hills, as defined and identified in this study, is estimated to cover **5,974 ha** or **16.2%** of the AONB, see **Note 1** for the methodology used to identify HNVF. This total comprises **3,882 ha of HNV farmland** (10.5% of the AONB) and **2,092 ha of HNV woodland** (5.7% of the AONB) see Figure 1-1.

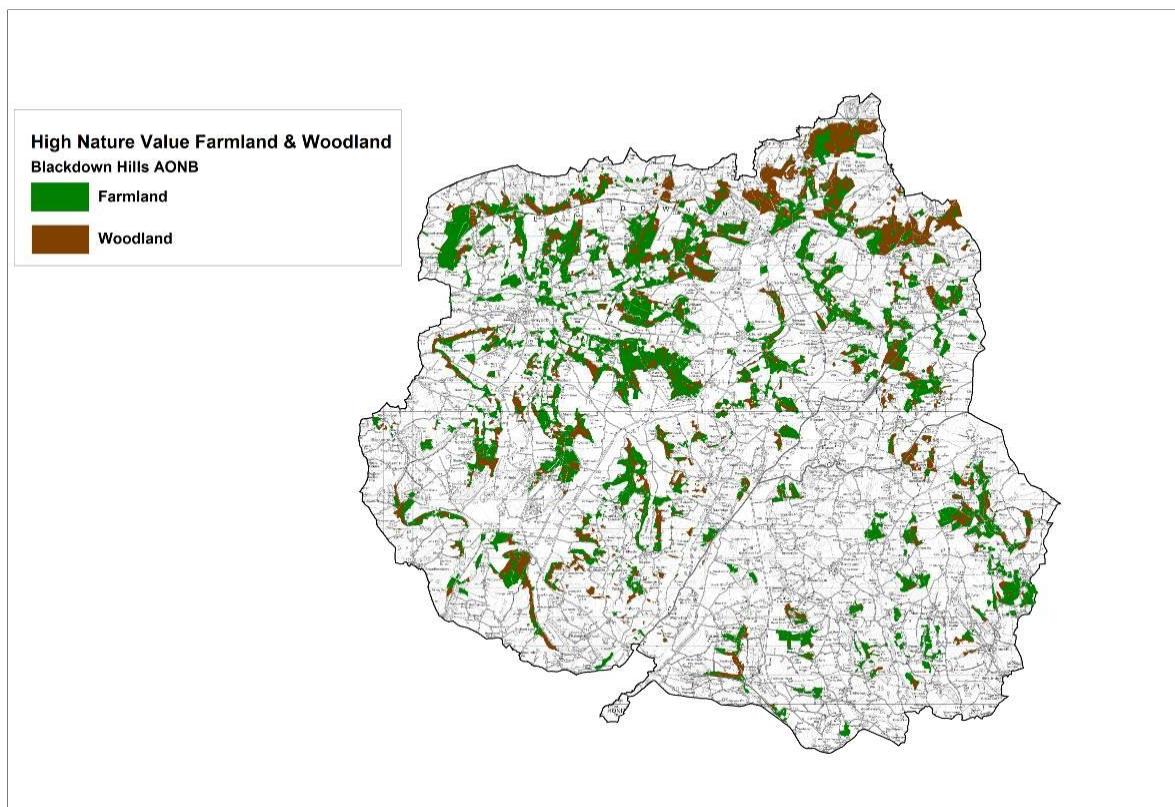


Figure 1-1: HNV Farmland and Woodland in the Blackdown Hills AONB

Of this HNV farmland and woodland, 637ha (10% of HNVF) is designated SSSI and 3,094ha (52% of HNVF) is designated as CWS. The combined total designated area is 3,731ha (62% of HNV), see Figure 1-2.

A breakdown of HNV farmland and woodland data for the Blackdown Hills AONB is shown in Table 1-4.

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Blackdown Hills	Total	Natura 2000	SSSI	CWS
HNV farmland	3,882 ha	3 ha	398 ha	1,837 ha
HNV woodland	2,092 ha	17 ha	239 ha	1,257 ha
HNV total	5,974 ha	20 ha	637 ha	3,094 ha

Source: Natural England 2011

Table 1-4: HNVF in the Blackdown Hills AONB

Strategic Nature Areas (SNA) have been identified across the SW of England. These represent biodiversity 'hotspots' and are priority areas for the management and restoration of wildlife habitats. The Blackdowns has a high density of SNAs. A large proportion of HNV farmland and woodland falls within these areas (see Figure 1-2).

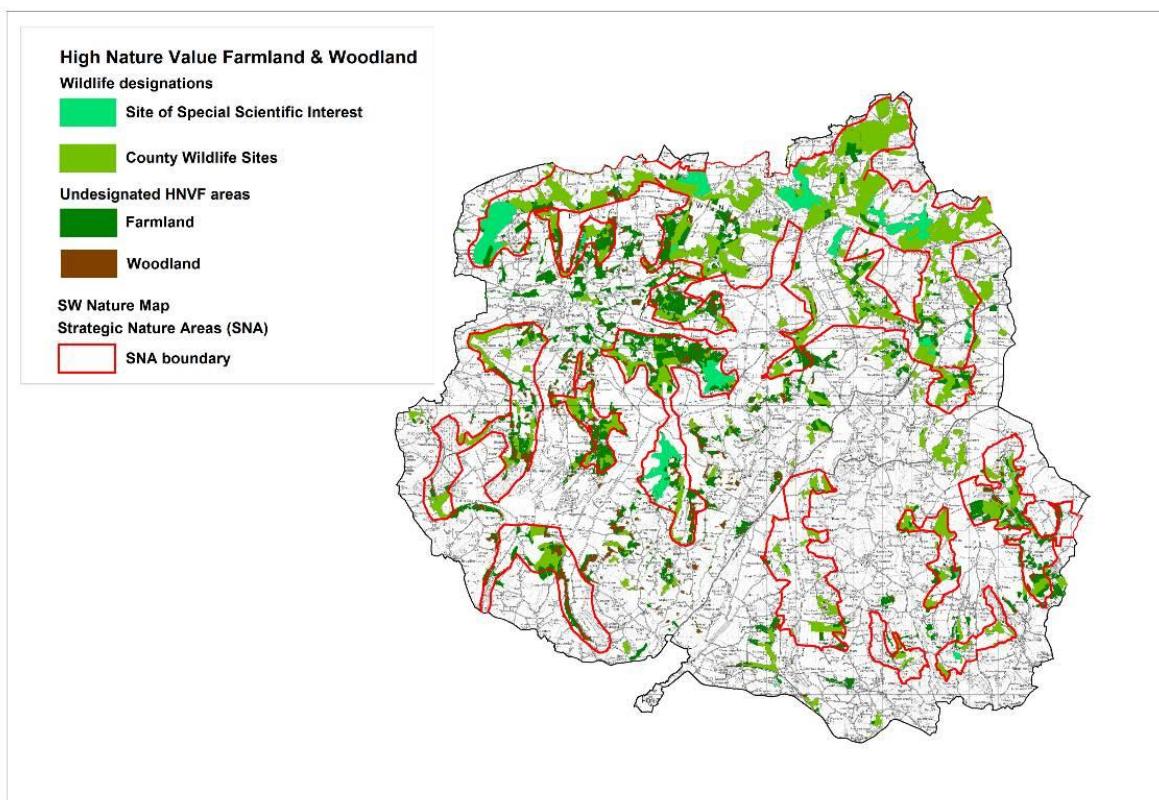


Figure 1-2: HNV Farmland and Woodland together with SSSI and CWS designations in the Blackdown Hills AONB

The occurrence of HNVF, and its relative significance for wildlife, is determined by a complex interaction of physical, ecological and human-induced factors. Physical factors include the topographical, chemical and hydrological nature of the land, which determines where vegetation of value for wildlife can occur. Ecological factors include vegetation structure, habitat patch size and relative isolation of habitat patches, which determine the wildlife any given location can support. Human-induced factors cover management regimes to which habitats are subjected, and extraneous influences on habitats via water courses, the atmosphere, or physical disturbance. These factors are developed in Table 1-5.

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Factor	Representation and character in Blackdown Hills
1. Physical structure	
Geology	Clay-with-flints cap on plateau, over free-draining Upper Greensand, overlaying impervious Lias clays with junction between the two giving rise to prominent springline zone. Intrusions of calcareous mudstones and limestone deeper into valleys.
Soil types	Acid soils on plateau and Greensand upper valley sides, richer clays and lime-rich soils further down. Complex intermingling of calcareous and acid soils subject to slippage on steep slopes.
Hydrology	Free-draining plateau. Prominent springline on valley slopes with seepages and permanently wet soils. Attempts to drain these soils often fail due to slippage of greensand cap over clays. Floodplain with riparian wetland area in valley bottoms.
Nutrient status	Nutrient-poor soils on acid plateau and steeper valley slopes, becoming more fertile on lower, shallower slopes and floodplains.
2. Amount and quality of semi-natural vegetation	
Habitat patch size, range of successional stages within patches	Some larger blocks of lowland heath on plateau and valley heads, sometimes contiguous with purple moor grass, wet heath and mire on valley sides. Generally small individual patches of purple moor grass and rush pasture on valley sides, sometimes strung out along springline zone forming continuous patches with varying proportion of wet woodland intermixed. Generally small enclosures of lowland meadow on shallower slopes lower in valleys. Small wetland patches on floodplains
Floral species diversity (forage for wild herbivores, nectar sources for insects, larval food plants, etc)	Springline habitats often very herb-rich (M23, M24, M25, MG5). High incidence of foodplants for Lepidoptera: vetches, trefoils, scabious etc.
Structural diversity (nesting/breeding sites, cover, prey availability)	Purple moor grass and wet heath in particular have high structural diversity from tussocky character, with high incidence of in-sward low scrub and larger patches of tall herb and secondary wet woodland
Relationship to key species' territory size and population area requirements	<p>Wet heath/purple moor grass/rush pasture/neutral grassland complexes offer single tracts in excess of 5 ha in many places. 5ha is considered the Minimum Dynamic Area for sustaining key Lepidopteran populations</p> <p>Larger area-demanding species (eg curlew) are poorly catered for with few heathland patches above 50ha.</p> <p>Species favouring ecotonal habitat edge sites (eg nightjar) are well served by complexes with open pasture, scrub patches and thick hedges in a dense mosaic.</p>
3. Semi-natural habitat distribution and landscape matrix	
Mean distance between patches	The Blackdowns landscape is dense and intimate, and most semi-natural habitat patches are within 500 metres or less of one another, especially laterally along slopes in springline zone.
Relationship to ranging ability of key species	Habitat patch distance is within ranging distance of most key fauna – Lepidoptera, bats, dormice, woodland birds. Infrequency of emigration of individuals of key butterfly species to new sites may suggest dense intervening hedges may act as a barrier for smaller invertebrates. However this woody infrastructure favours woodland species like dormouse which can range aerially

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	between sites using hedges as corridors (Bright, 1996)
Transition through semi-improved land	<p>Semi-improved pasture occurs generally as a consequence of soil wetness, low fertility, or a combination of the two.</p> <p>Many rush pasture sites are fringed by semi-improved rushy land, where historical drainage attempts have failed or begun to revert. This semi-improved pasture may occupy whole fields, or just the lower, wetter ground, or may surround localised seepages and follow surface runnels.</p> <p>Semi-improved dry acid grassland often occurs on the steepest slopes, where fertiliser or farmyard manure additions have not been applied due to access limitations, or have leached out because of percolation through thin soils on steep slopes. These steep areas may occur as larger expanses just below the plateau, or as small zones within an otherwise more gently-sloping field. Sometimes these areas contain a proportion of bracken.</p> <p>Where former or remaining dry heathland has become degraded, a semi-improved transition zone of bracken may occur.</p> <p>Semi-improved soft rush pastures, dry acid grassland and bracken have low herb richness, but offer similar structural habitat conditions to true semi-natural rush pasture and hence are likely to provide an important buffering role. They may shield semi-natural vegetation from the negative effects of more heavily fertilised land nearby, and help retain water within marshy ground. Although they will not generally contain many nectar sources or food plants for invertebrates, these semi-improved areas may offer ground nesting sites for some birds and shelter for small mammals.</p>
Permeability of intervening landscape between habitat patches	Generally small field sizes on the valley slopes, combined with tussocky semi-improved field edges and corners, offer a sympathetic environment for movement of species between semi-natural habitat patches. On the plateau fields are larger, with less structural heterogeneity, and are thus more hostile to species movement. Lower valley slopes again generally have larger field sizes and more homogenous pasture, but in smaller valleys, or higher parts of valleys, small field size continues right down into the base of the valley.
Linear features	Thick ancient hedgerows predominate on steeper valley sides and down into valley bottoms. Field size in this zone is generally small, with consequent high density of connecting features. These hedgerows also have frequent mature trees. Streams emanating from the springline form small winding watercourses, generally tree or scrub-lined, down to larger tributaries and main rivers in the valley bottoms. The main rivers often lack much marginal woody vegetation, with stock having direct access from adjoining improved pasture.
Boundaries between habitats	Woody vegetation has both a positive and a negative effect on continuity between open ground habitat patches. Scrub and wet woodland often 'insulates' semi-natural purple moor grass and rush pasture sites from surrounding improved land, offering a useful buffer and sheltered edge. However thick hedges can provide an impenetrable boundary between semi-natural open ground habitat patches and surrounding semi-improved land, preventing emigration of flying species to new sites.
Diversity of land use pattern	The above range of features creates a very diverse and dense pattern, but the predominant land use in the most diverse valley side areas is pasture, with only limited intermixing of cropped land.

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4. Management of semi-natural vegetation	
Grazing – type, stocking rate, timing – and mowing	<p>High wildlife-value purple moor grass/rush pasture complexes are generally lightly stocked with beef cattle. Wet soils preclude year-round grazing, so site grazing is often limited to summer stocking, generally with store cattle or young stock, occasionally traditional hardy breeds. Where stocking levels are too high, localised poaching may occur, disrupting surface soil profiles and reducing vegetation diversity. Where stocking levels are too low (say under 0.5 LU/ha), coarse vegetation and scrub predominate, reducing vegetation diversity.</p> <p>Level pasture on better soils is used for silage or haylage production. Where traditional meadows cut for hay have moved to silage production, with accompanying heavier fertilising, species diversity declines while timing of cutting can impact on ground nesting birds.</p>
Cropping – crop type, cultivation, timing	Arable cropping confined to lower valley slopes and parts of plateau, and includes maize, cereals and root vegetables. Genuine mixed cropping pattern with cultivated and grazed land in a mosaic, is rare in the Blackdowns. Few stubbles offering forage for birds. Some weed-rich arable margins where grant aid encourages these.
Hedge features	Hedges are traditionally managed by laying in some areas, with benefits for wildlife and longevity of thick hedge vegetation, otherwise flailed. Mature hedgerow trees are frequent, with some in-field trees in pastures on lower slopes. Plateau hedges are flailed more intensely and closely, and have fewer mature trees.
Forestry and woodland management	Secondary wet woodland is common on the springline zone, but sparser on lower slopes and on the plateau. Some larger tracts of woodland are managed as game cover, some for supply of domestic firewood. Large public forest estate on northern ridge and western steeper scarp slopes. Coppice management is infrequent. High forest management or long-rotation coppice offers best conditions for wildlife, while some neglected woodlands lose species diversity due to loss of structural diversity or influx of invasive species.
Atmospheric influences	There is evidence that atmospheric nitrogen deposition may be affecting growth rates of coarser grasses on semi-natural and semi-improved pasture, possibly with an adverse effect on species diversity.
Water quality	Water quality in the Blackdowns is generally high, though localised problems occur due to slurry leakage or other point source pollution. Some erosion problems on arable land, especially maize.
Disturbance	Human access may interfere with diversity of fauna, especially ground nesting birds, though few sites have a high visitor pressure.

Table 1-5: Factors determining HNVF occurrence in the Blackdown Hills AONB

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In the Blackdown Hills AONB, the relationship between HNVF occurrence and physical features of the landscape follows a clear pattern. Most HNVF occurs on the steeper valley sides or in valley heads, around the 'Springline', where overlying porous Upper Greensand meets impermeable Lias Clays. This zone is characterised by waterlogged soils, steep slopes and smaller field sizes, making productive farming difficult. Wettest areas tend to retain high quality HNVF where they are still actively managed, while semi-improved HNVF is often associated with unsuccessfully drained areas. HNVF also occurs more rarely on the level plateau above the springline, usually associated with former common land, or below the springline on shallower slopes, or on the floodplain close to watercourses. This relationship to landform is shown diagrammatically in Figure 1-3.

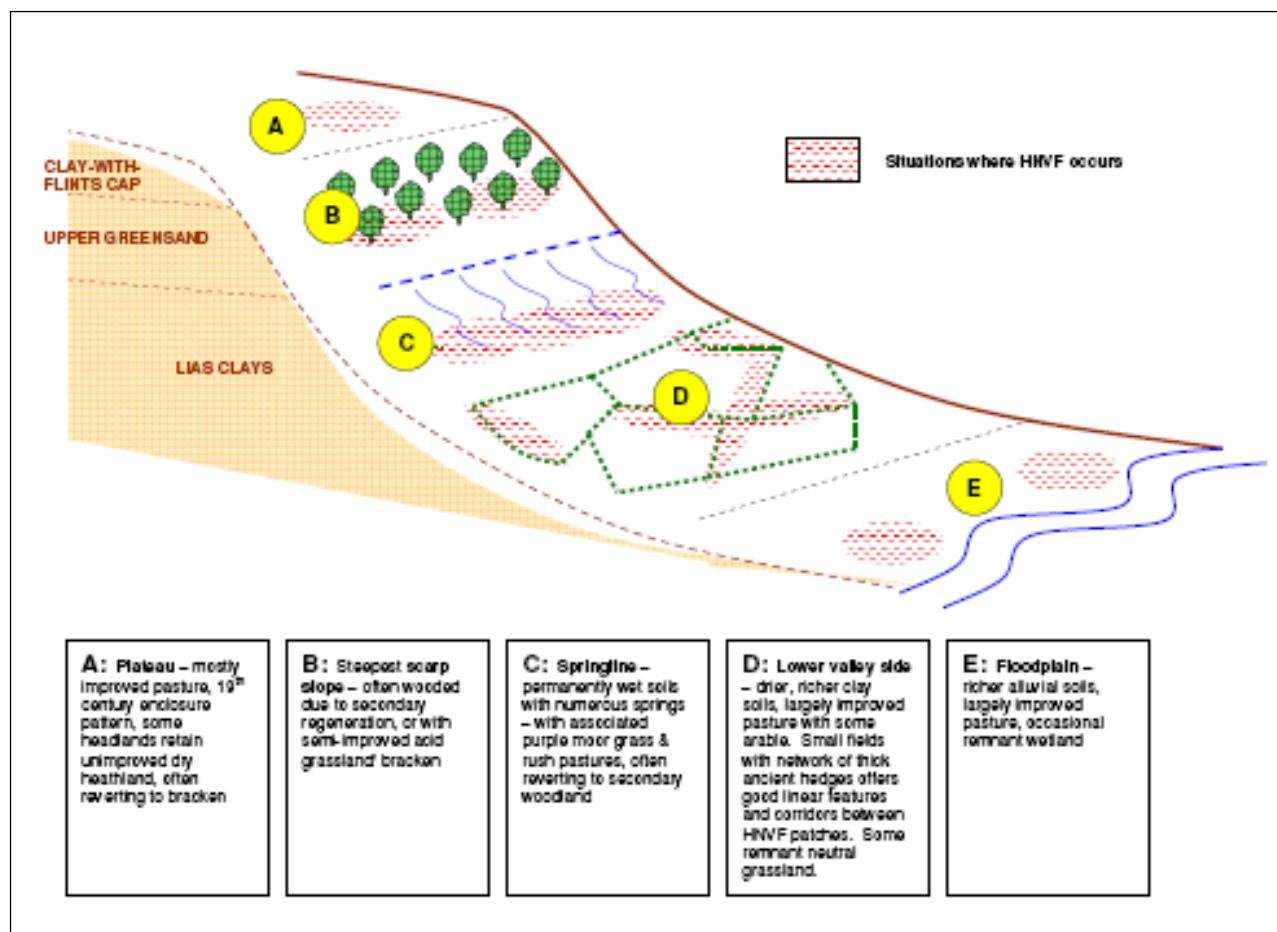


Figure 1-3: Diagrammatic representation of key HNVF components in the Blackdown Hills AONB

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The following aerial photos illustrate typical patterns of HNVF occurrence in the Blackdown Hills AONB, taken from the example farms considered in more detail later in this study.

Figure 1-4 HNVF: Small fields, thick hedge lines and small woodlands

In this example, which shows part of the estate described in Section 2 as **Farm 4**, there is a close intermixing of small fields, thick hedge lines and small woodlands. Browner, more mottled fields are generally semi-natural purple moor grass/rush pasture/neutral grassland. Springline runs left to right across across upper half of picture. A small stream with lakes along its length runs through valley bottom, NE to SW.



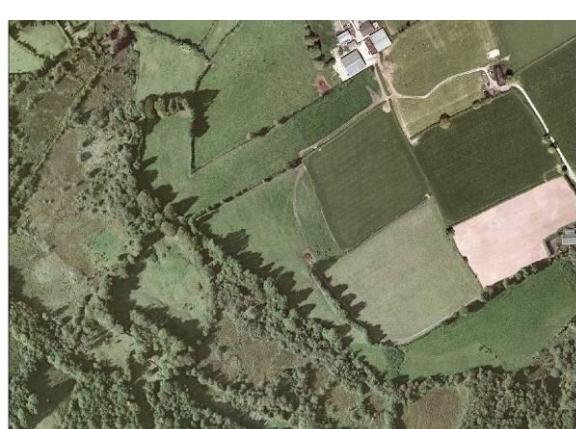
Figure 1-5: HNVF: Very small fields with thick hedgerows running down to stream

This example shows part of the complex of small holdings and parts of larger farms described as **Farm 5** in Section 2. It shows very small fields with thick ancient hedgerows, running down to stream running NW to SE. Several of these lower fields contain good quality semi-natural neutral grassland. Some cropped land intervening on larger fields in between.



Figure 1-6: HNVF: Level plateau contrasting with steep valley slope

This shows part of **Farm 1**, with a starkly contrasting level plateau top to the NE, with larger fields and improved pasture, and a steep valley slope to the SW carrying a high quality purple moor grass / rush pasture / wet heath / wet woodland mosaic.



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A typical springline slope is illustrated in the Figure 1-7 below, showing a network of HNVF. On the top of the hill is improved pasture (1), below which on the steepest part of the slope is secondary woodland and bracken (2), which has been abandoned within the last 30 years and has reverted from previously open wet heath and mire. Below this, the darker green pasture (3) is small fields of very diverse rush pasture and fen meadow, providing the most valuable areas for wildlife. These fields are fringed by thick hedges (4), and below these is a zone of semi-improved rush pasture (5) with tussocky soft rush. Lower still is richer, drier soil with improved pasture (6).



Figure 1-7: Valley side in the Bolham Valley, near Hemyock

A transition from semi-improved HNVF into semi-natural herb-rich HNVF is shown in Figure 1-8 below. In the foreground (1) is a mixture of semi-improved neutral grassland with patches of soft rush. This area of permanent pasture has a high forb content but is not herb-rich. However by the top of the field around (2) the sward becomes herb-rich semi-natural neutral grassland, and over the hedge bank the springline zone is immediately encountered, with semi-natural purple moor grass and rush pasture. To the left (3) is semi-natural broadleaved woodland. This whole area can be said to constitute HNVF, partly because it is all managed under the same low intensity regime, and partly because the semi-improved grassland is buffering the semi-natural land above it, and providing comparable structural conditions and nutrient status.



Figure 1-8: Semi-improved pasture near Madford

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1.3 Farming characteristics and trends in the Blackdown Hills

This section is based on the best available farming data for the Blackdown Hills AONB at the time of writing: see **Note 2** for a description of sources used. The current state and trends relating to farming in the Blackdown Hills AONB is outlined and the impacts on farms with HNVF explored.

The Blackdown Hills AONB is predominantly a livestock farming area, dominated by dairying and beef rearing. The area grows good grass, but the predominance of valley slopes and the limited extent of deep productive soils mean that arable cropping is not a major feature. Farm size is relatively low and there is a higher than average proportion of long-standing, small traditional family farms. There are few intensive farms, though dairy productivity can be fairly high, and there are small intensive units in places based on outdoor pigs or poultry. There are a number of entrepreneurial farm businesses which have developed value-added enterprises built on local provenance, traceability and environmental quality.

The Blackdown Hills AONB Management Plan 2009-2014 states that:

"The small dairy farms are declining and there is an ongoing trend towards the division of farm units and the separation of farmhouse from the land. Thus farming is being concentrated on fewer, larger, sometimes dispersed units, while many farms are becoming essentially residential, for keeping horses or as 'hobby farms'. This can lead to the countryside taking on a suburban appearance, but these new owners may deliver more environmental conservation."

Current farm survey data (primarily based on the Defra June 2008 survey) and trend data for the period 2000-2007 (based on Defra June Survey for 2000-2007) indicates the state of farming in the Blackdown Hills AONB, see Table 1-6 and Table 1-7.

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<p>Summary: Farm holdings in the sample parishes are relatively small, and likely to be owned rather than rented. There is a trend away from dairying towards non-mainstream farming (eg equine, rented forage, smallholdings etc), and most holdings are either of that character, or are beef and sheep farms. The average size of holdings is decreasing as previous holdings are broken up. The area of crops and fallow and temporary grass is quite low, but there is more permanent pasture, rough grazing and woodland.</p>	
Agricultural land	<p><i>Farm Survey June 2008:</i> Agricultural land in the AONB comprises 33,971 ha (92% of all AONB land).</p> <p><i>Trends 2002-2008:</i> 18% increase in the total area, which increased from 28,724 ha to 33,971 ha. This increase is primarily due to the registration of new holdings when SPS was introduced in 2005.</p>
Farm holding number and size	<p><i>Farm Survey June 2008:</i> There are 1,346 farm holdings in the AONB with an average holding size of 25.23ha.</p> <p><i>Trends 2002-2008:</i> An 11% increase in the number of farm holdings. By size category, the numbers of farms in all size categories increased but particularly in the lower size categories, under 5ha up 33%, and 5 to 20ha up 22%. This increase reflects the registration of new holdings and, to a lesser extent, the division of larger holdings</p>
Farm tenure	<p><i>Farm Survey June 2007:</i> The tenure of farmland in the AONB is 81% owned and 19% rented. This compares with 75% owned in Devon and 68% owned in the South West region.</p>
Farm categorisation	<p><i>Farm Survey June 2008:</i> In the AONB 23% of holdings are categorised as Grazing Livestock (lowland) and 13% Dairy, followed by 49% as 'Other' (see note). The average size of Dairy holdings (82.3ha) is significantly larger than Grazing Livestock (lowland) holdings (29.9ha). The average size of 'Other' holdings is 7.1ha.</p> <p><i>Trends 2002-2008:</i> There has been a 17% decrease in the number of dairy farms, a 3% decrease in the number of mixed farms, a 57% increase in the number of 'Other' farms and 5% increase in the number of grazing livestock farms. This shift out of dairying and an increase in other holdings mirrors national and regional trends.</p> <p><i>Note:</i> Farms are categorised according to whether a particular enterprise accounts for two thirds or more of Standard Gross Margin (SGM). For example, cereal farms are those where cereals accounts for more than two thirds of the total SGM. 'Other' holdings are those which either do not fit well with mainstream agriculture, such as specialist horses, or which are of limited economic importance, such as specialist set-aside, specialist grass and forage (no livestock) and non classifiable holdings.</p>
Farm size distribution	<p><i>Farm Survey June 2008:</i> Holdings over 50ha account for 17% by number and 70% by area of the total holdings in the AONB. At the other end of the scale, holdings under 5ha account for 50% by number and just 3% by area. The holdings categorised under 5ha in size are most likely to be in the 'other' category. At least a proportion of these will fall in the category of non-farming landowners, 'lifestyle' farmers or similar. This "other" category accounts for 14% of the AONB farmland area.</p> <p><i>Trends 2002-2008:</i> The number of farms in all size categories increased but particularly in the lower size categories, the number of under 5ha holdings was up 33%, and 5 to 20ha was up 22%.</p>
Land uses	<p><i>Farm Survey June 2008:</i> The main land uses on agricultural holdings in the AONB are permanent grass (69%), crops and bare fallow (11%) and temporary grass (11%) followed by woodland (5%) and rough grazing (3%) – see note.</p>

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	<p><i>Trends 2002-2008:</i> The area of permanent grass has increased by 25%, temporary grass has decreased by 4%, rough grazing has decreased by 33%, cereals has increased by 10%, maize has increased by 74% (to 1,068ha, on 27% more farms) and set-aside has decreased by 11%.</p> <p><i>Note: 'Permanent grassland' is defined as grassland more than 5 years old, 'temporary grassland' is grassland sown within the last 5 years; 'rough grazing' includes heathland, moors, mountain or hills where a farmer owns or has sole grazing rights (this measure excludes common grazing).</i></p>
Livestock numbers	<p><i>Farm Survey June 2008:</i> There are around 51,000 cattle (including 17,000 dairy cows and 3,000 beef cows), 47,000 sheep, 12,500 pigs, 813,000 poultry and 1,000 horses in the AONB. The percentage of holdings with different types of stock is as follows: cattle (30%); sheep (22%); Poultry (17%); Horses (16%) and Pigs (7%).</p> <p><i>Trends 2002-2008:</i> Cattle numbers are up 4%, with a 3% increase in dairy females (2yrs+) and a 8% increase in beef females (2yrs+). The total number of holdings with cattle is down 13%. The number of holdings with beef females (2yrs+) is up 15%. Sheep numbers are down 13%. Holdings with sheep are up by 3%, although holdings with breeding ewes are down 6%. Pig numbers are down 46%. Holdings with pigs are 60%. (Pig numbers can fluctuate significantly from year to year). There are no trend figures for horses but some of the increase in smaller farm holdings and increase in permanent grass area (for grazing or hay for horses) may be related to keeping horses.</p>
Farm labour	<p><i>Farm Survey June 2007:</i> The agricultural workforce in the AONB totals 1,717 including 1,394 farmers, 25 managers and 298 farm workers. Of this total, 745 are full time, 897 are part-time and 75 are casual.</p> <p><i>Trends 2002-2007:</i> Total number of full-time workers (farmers, managers, male and female workers) is down 9% but the total number of part-time workers has increased by 11%. The casual workers have been worse hit with 43% fewer holdings employing 50% fewer casual workers. The total number employed in agriculture in the AONB is down 3% from 1,777 to 1,717.</p>

Source: Defra/Natural England 16.6.10

Table 1-6: Farm Survey Data for the Blackdown Hills AONB

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ROBUST FARM TYPES	Number of holdings	%	Area (ha)	%
Cereals	31	2%	2,158	6%
General Cropping	7	1%	601	2%
Horticulture	36	3%	162	0%
Specialist Pigs	21	2%	292	1%
Specialist Poultry	56	4%	1,082	3%
Dairy	171	13%	14,068	41%
Grazing Livestock (LFA)	-	0%	-	0%
Grazing Livestock (lowland)	314	23%	9,381	28%
Mixed	46	3%	1,516	4%
Other	664	49%	4,712	14%

FARM SIZE	Number of holdings	%	Area (ha)	%
<5ha	651	48%	861	3%
5<20ha	280	21%	3,020	9%
20<50ha	188	14%	6,182	18%
50<100ha	142	11%	10,213	30%
>=100ha	85	6%	13,695	40%

TOTAL HOLDINGS	1,346	100%	33,971	100%

LAND USE	Number of holdings	%	Number of land area (ha)	%
Crops and bare fallow (A99)	176	13%	3,776	11%
Vegetables and salad for human consumption (B99)	10	1%	5	0%
Fruit (C99)	42	3%	47	0%
Temporary grass (G1)	250	19%	3,717	11%
Permanent grass (G2)	917	68%	23,285	69%
Rough grazing - sole rights (G5)	195	14%	989	3%
Woodland (G14)	320	24%	1,642	5%
All other land (G17)	251	19%	492	1%

LIVESTOCK	Number of holdings	%	Number of livestock	%
Cattle (K299)	398	30%	50,955	na
Pigs (L98)	90	7%	12,461	na
Sheep (M98)	302	22%	46,826	na
Poultry (N98)	233	17%	812,813	na
Horses (P90)	221	16%	1,095	na

Source: Defra / Natural England 16.6.10

Table 1-7: Farm Survey Data for the Blackdown Hills AONB - June 2008

The potential impacts of these farm characteristics and trends on HNVF and HNVF management are outlined below:

- There is an increasing number of smaller holdings (up to 20ha) and ‘other’ holdings in the AONB. These holdings will include HNVF (see analysis of Natural England data below); some will be owned by non-farming landowners.
- Dairy and livestock farms predominate in terms of land area (despite the continuing restructuring in the dairy sector in particular). Farming systems associated with these farm types will continue to have a major influence on the way in which HNVF is managed.
- Permanent grassland is increasing as a proportion of total land use, with less temporary grassland and less rough grazing. This suggests that some rough grazing land (which may have been HNVF) has been improved or abandoned.

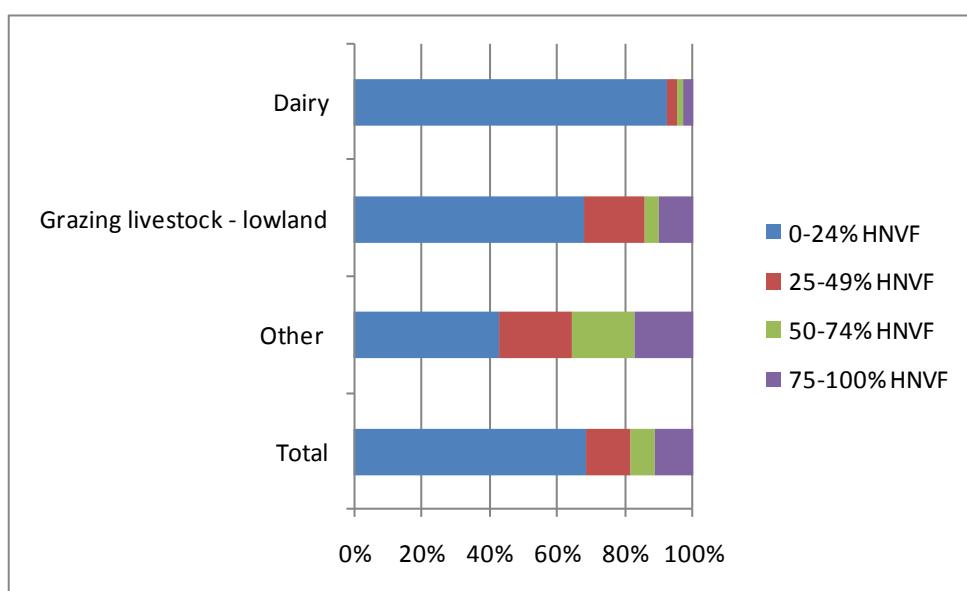
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- Permanent grassland – improved, semi-improved and unimproved – will continue to be the main land use underpinning HNVF.
- Cattle numbers have increased in recent years suggesting good availability for grazing of HNVF, but also potentially increased risk on some farms in terms of increased stocking rates. By contrast, sheep numbers have decreased.
- Less full time and more part time labour, and less casual labour, suggests that less farm labour is available for HNVF management now compared to previously. This trend is likely to continue.

Natural England data for holdings with HNVF in four sample parishes in the Blackdown Hills (see Section 2 and see **Note 5** for more details) provides additional detail of the characteristics of holdings with HNVF:

HNVF as a proportion of total holding size varies according to farm type, see Figure 1-9.

- Dairy farms predominantly have a limited amount of HNVF (under 25%) as a proportion of total holding size.
- Grazing livestock farms have a greater variation of HNVF as a proportion of holding size.
- 'Other' holdings are more balanced in terms of HNVF as a proportion of holding with a considerable proportion of these holdings being over 50% HNVF.
- Overall, 68% of holdings have 0-24% HNVF as a proportion of total holding size, with the remainder fairly even balanced across categories with more HNVF.

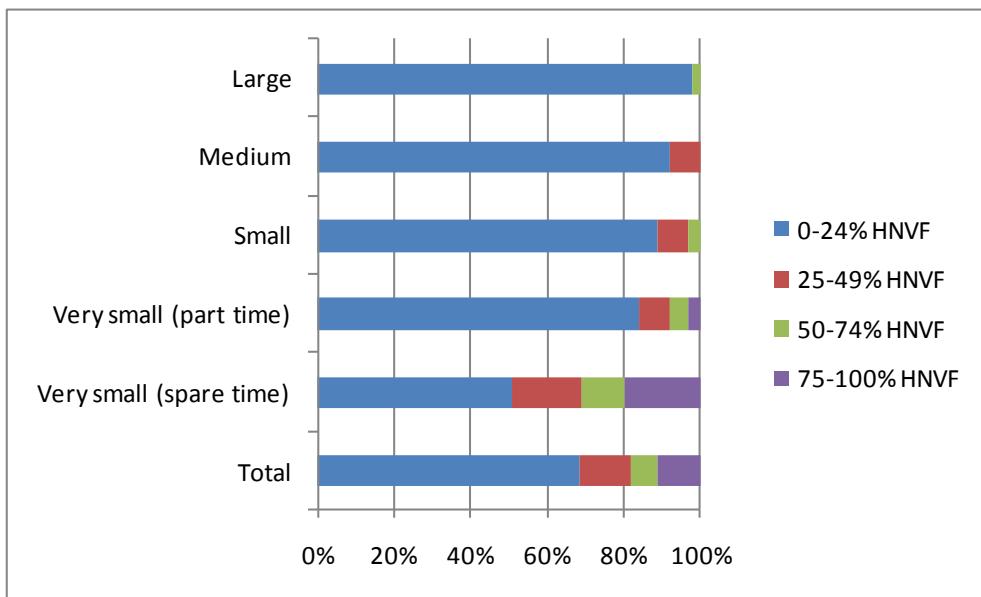


Source: Natural England 17.2.11

Figure 1-9: HNVF as % of Holding Size for Different Types of Farm with HNVF in the Blackdown Hills AONB Sample Parishes

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HNVF as a proportion of total holding size also varies according to farm size, see Figure 1-10. There appears to be a weak negative correlation between farm size and % HNVF, with more small or very small holdings having a higher % HNVF. Very small spare time holdings are more balanced in terms of HNVF as a proportion of holding.



Source: Natural England 17.2.11

Figure 1-10: HNVF as % of Holding Size for Different Sizes of Farm with HNVF in the Blackdown Hills AONB Sample Parishes

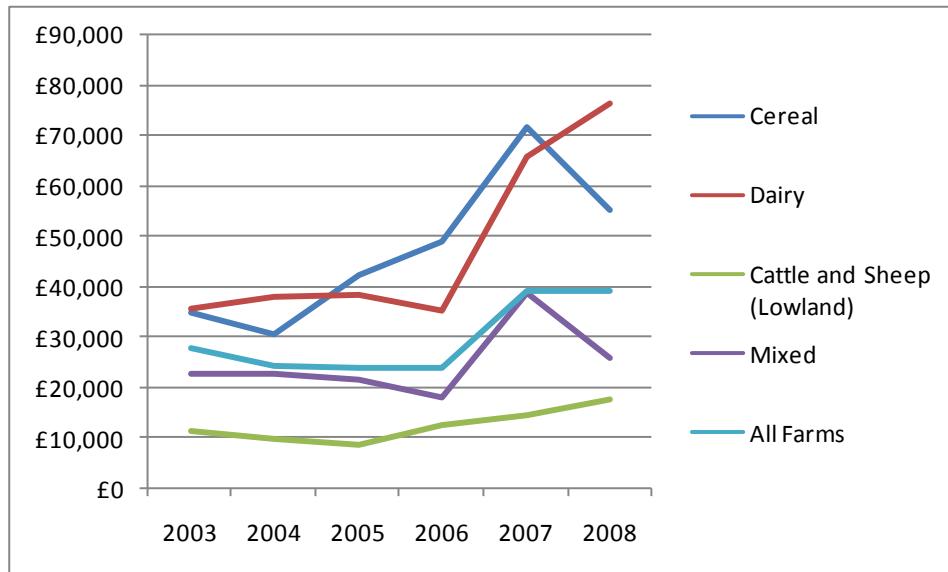
Only 76% of HNVF is registered on the Rural Land Register (RLR) – a pre-requisite for the receipt of support in the form of SPS and agri-environment scheme (AES) payments. The remaining 24% of HNVF would not be supported by such payments. This land is likely to include unregistered farmland (for example, land on small amenity holdings) and unregistered woodland (there was initially no obligation on farmers to register woodland on the RLR although this is now required under SPS and AES rules).

1.4 Farm Business Income

There are no specific farm business income figures available for the Blackdown Hills AONB. However data can be drawn however from the Farm Business Survey (FBS) and relevant reports. Farm Business Income (FBI) is the key measure used. See **Note 3** for background on FBI and data sources.

Figure 1-11 indicates the Farm Business Income (FBI) for different farm types in SW England and shows how FBI has changed since 2003/4. Cereal and dairy farms have the highest FBI, followed by mixed farms and lastly lowland cattle and sheep farms, whose FBI in 2008/9 was £17,668. There has been an increase in FBI for all farm types. Dairy have experienced the greatest increase (115%), followed by cereal farms (60%), lowland cattle and sheep farms (59%) and mixed farms (15%). The decrease in cereal and mixed farm FBI from 2007/8 to 2008/9 is noticeable, this reflects the high commodity prices in 2007 and subsequent fall back.

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Source: Farm Business Survey 2008. Adapted from Lobley et al (2009)

Figure 1-11: Farm Business Income – SW England – Trends

Table 1-8 shows the breakdown of FBI for different farm types in SW England. This shows for all farms that Single Payment Scheme (SPS) income accounts for a significant 53% of FBI, followed by agricultural output (21%), diversification (14%) and agri-environment payments (13%).

These totals mask big variations between farm types. Dairy farms obtain 68% of their FBI from milk and other agricultural products, 28% from SPS and only 3% agri-environment payments and 1% from diversification. Mixed farms on the other hand obtain a very significant 86% from SPS, 19% from agri-environment payments, 8% from diversification and -12% from agriculture. Lowland cattle and sheep farms are similar with 73% of FBI from SPS, 20% from diversification, 18% from agri-environment payments and -10% from agriculture – these are the farms predominantly maintaining HNVF in the Blackdown Hills AONB. Cereal farms are also dependent SPS income (63%), diversification (24%) and agri-environment payments (14%) with agricultural outputs representing -1% of FBI (in 2007/8 this was 10%).

	Sources of Income									
	Agriculture	%	Agri-environment payments	%	Diversification	%	Single Payment Scheme	%	Farm Business Income	%
Cereal	-£430	-1%	£7,596	14%	£13,256	24%	£34,871	63%	£55,294	100%
Dairy	£52,005	68%	£2,630	3%	£400	1%	£21,382	28%	£76,417	100%
Cattle and Sheep (Lowland)	-£1,832	-10%	£3,174	18%	£3,502	20%	£12,823	73%	£17,668	100%
Mixed	-£3,186	-12%	£4,806	19%	£2,129	8%	£22,201	86%	£25,950	100%
All Farms	£8,146	21%	£4,953	13%	£5,364	14%	£20,696	53%	£39,082	100%

Source: Farm Business Survey 2008. Adapted from Lobley et al (2009).

Table 1-8: Farm Business Income – SW England - Sources of Income

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It is important to note that the nature of farming in the Blackdown Hills, with relatively small farms, less productive land, smaller enterprises and higher overheads (e.g. labour) as a proportion of income, is likely to mean that the area's lowland grazing livestock and dairy farms are yielding even lower FBI than the figures indicated above. Relatively poor participation in agri-environment schemes and sometimes limited diversification is likely to compound this further and result in lower FBI. Correspondingly the dependency of Blackdown farms on SPS income is likely to be higher than the figures indicated above. This applies as much to farms with HNVF as to those without (in spite of the fact that 24% of HNVF is not registered on the RLR and hence not in receipt of SPS or AES payments).

To illustrate this, the physical and financial figures for the average lowland grazing livestock farm (one which typically may have HNVF) used in the FBS in 2008 have been adapted to reflect the farming characteristics of an average lowland grazing livestock farm in the Blackdown Hills, see Table 1-9. This shows a reduced 'average' FBI or net profit of £10,695. SPS accounts for 80% of this net profit.

	South West			Blackdown Hills			
		£/ha	£/Farm		£/ha	£/Farm	Notes
Physical data							
Farm size	74.7 ha			50 ha est.			
UAA	69.2 ha			46 ha est.			
Perm. grass + rough grazing (% of UAA)	77%			>77%			
Stocking	75.3 LU						
Stocking density	1.09 LU/ha			<1.09 LU/ha			
Financial data							
Agriculture		-£24	-£1,832		-£30	-£1,500	Less productive land (75%)
Agri-environment payments		£42	£3,174		£38	£1,890	Slightly less agri-environment scheme income (90%)
Diversification		£39	£3,502		£35	£1,755	Slightly less diversification income (90%)
Single Payment Scheme		£171	£12,823		£171	£8,550	Similar SPS income (100% regional area payment by 2012)
Farm Business Income		£228	£17,668		£214	£10,695	

Source: base data from Farm Business Survey 2008.

Table 1-9: Farm Business Income – Lowland Grazing Livestock Farm – Blackdown Hills

1.5 Agri-environment scheme participation

A total of 17,411 ha of land in the Blackdown Hills AONB is in some form of agri-environment scheme, equivalent to 47.2% of total area and 51.9% of total agricultural area. Environmental Stewardship accounts for 80.6% of total agri-environment agreement area.

1,807 ha (46%) of HNV farmland in the Blackdown Hills AONB is under some form of agri-environment scheme agreement. Environmental Stewardship accounts 73% of this, including 48% in ELS or OELS and 25% in some form of HLS agreement. Classic schemes (ESA) accounts for the remaining 27% of HNV farmland under agri-environment scheme agreement. It is worth noting that only 11.5% (447 ha) of HNV farmland in the Blackdown Hills is under some form of HLS agreement.

A breakdown of agri-environment scheme participation is shown in Table 1-10 and a map shown in Figure 1-12.

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Blackdown Hills (total HNV farmland 3,882 ha)	Area of land under agreement in AONB boundary (ha)	HNVF under agreement (ha)	HNVF under agreement (%)	% of total HNVF
HLS only	302	178	10%	5%
ELS+HLS	1,256	248	14%	6%
OELS+OHLIS	236	21	1%	0.5%
ELS only	11,766	844	47%	22%
OELS only	477	27	1%	0.5%
Env. Stewardship sub-total	14,037	1,318	73%	34%
ESA	3,374	489	27%	13%
CSS	n/a	n/a	n/a	n/a
Classic schemes sub-total	3,374	489	27%	13%
Total	17,411	1,807	100%	47%

Source: Natural England 17.2.11

Table 1-10: Agri-environment Scheme Participation in the Blackdown Hills AONB

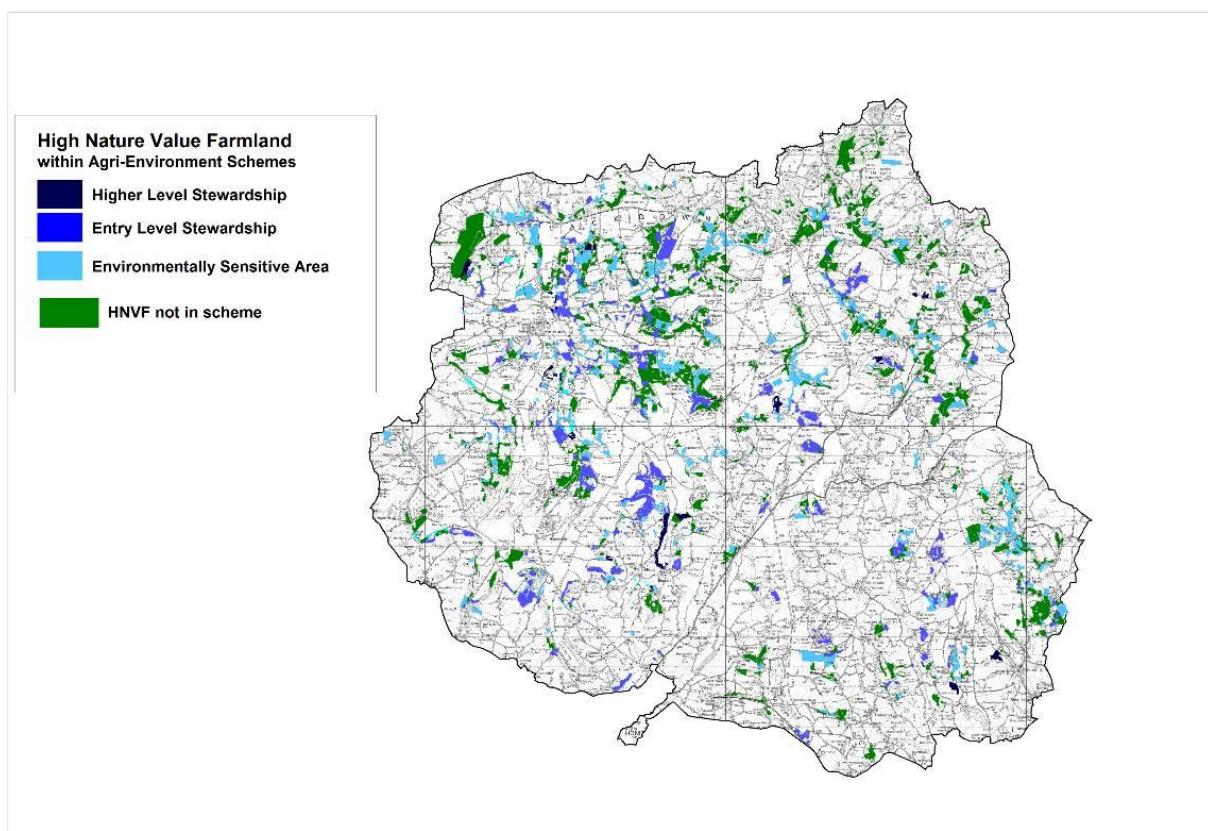


Figure 1-12: HNVF in Agri-environment Schemes in the Blackdown Hills AONB

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Natural England Holding Assessment Toolkit (HAT) scores - which indicate the extent to which individual holdings address or have the potential to address particular environmental priorities under HLS are available for 4,072ha (59.4% of HNVF) in the Blackdown Hills AONB; not all holdings have been HAT-scored. 2,500ha (36% of HNVF) has a HAT score of A (i.e. most suitable for HLS) with the remainder scored B, C, D and E. There is a reasonably good correlation between HNVF and a high HAT score, with 61% of the HNVF which has been HAT scored making it into the top grade, A. See **Note 4** for more detail on HAT criteria and scoring.

A study by Carver Knowles from 2008 provides further information on ELS options selected by participants in the AONB:

- Total ELS area submitted: 2,473ha
- Average farm size: 51.52ha (*NB: This contrasts with the average holding size based on Defra June survey data of 25.23ha (AONB). The average farm size of 51.52ha is more realistic, as farm businesses often comprise more than one agricultural holding*)
- Average annual payment per farm: £1,546
- The most popular options were Grassland management (EK2, EK3 & EK4, contributing 53% of points scored; Hedgerow management options (EB1, EB2 and EB3, contributing 8.8% of points scored; Ditch management option (EK6, contributing 8.5% of the points scored - which is nearly equal to the total hedgerow management contribution, supporting the fact that many farmers like to cut their hedges every year). The combined hedge and ditch management options (EK8, EK9 and EK10) contributed 8% of the total points scored.
- In total, hedge, ditch and grassland management options (not including EK5) contributed 79% of the points.
- Mixed stocking (EK 5) contributed 5.78%, which considering the landscape is particularly low, highlights that many farms within the Blackdowns are beef and dairy.

Subsequent work by Agri-BIP (2010) to increase ELS uptake in the Blackdown Hills (and the transfer of land from ESA into ELS agreements) provides the following information:

- ELS area submitted: 1,372 ha
- Average farm size: 41.57ha
- Average payment per farm (annual): £1,247
- The most popular options were Grassland management, Hedgerow management, Arable management, Protection of traditional farm buildings, Protection of in-field trees,
- These options comply with the suggestions favoured in the guidance notes covering JCA 147, *The Blackdowns*.

Data on the effect of agri-environment schemes on HNVF is not available at the time of writing, but anecdotal and individual case experience suggests the following:

- The ESA served to maintain features such as hedgerows, ditches and field margins rather than actively encourage investment in management of more substantial HNVF features. As such it is unlikely to have stemmed the decline in springline habitats due to abandonment, though some sites may have been retained which would otherwise have been subject to further drainage and re-seeding.

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- ELS is likely to be continuing support for hedgerow and ditch management and the extensive, low input management of permanent pasture (which would include semi-natural, semi-improved and improved grassland, but not temporary leys). However, given the limited payment available (£30 per ha per year), ELS is unlikely to be bringing about a significant change in management. For example, areas of wetland along watercourses which had previously been fenced off to avoid livestock access problems, are unlikely to be brought back into active management as a consequence of ELS.
- Where HLS has been applied to substantial areas or whole farms, it is helping to maintain a complex mosaic of HNVF features. HLS payment rates are typically £200-300/ha for the main options supporting species-rich, semi-natural grassland (HK6-8 together with supplements) and these payments can make a significant difference to the maintenance of existing HNVF and/or its restoration and even re-creation. In other cases, the boundary of land supported by HLS may be quite limited, and while maintaining the immediate semi-natural vegetation it may not be helping to maintain the connections between this habitat and the wider landscape.
- Evidence from DWT (2007) and others suggests that even with agri-environment scheme agreements, issues such as under-grazing and scrub and bracken encroachment can continue to persist (see Section 2.5).

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2 Farming with High Nature Value Farmland in the Blackdown Hills – Findings from Interviews and Literature Review

2.1 Introduction

This section sets out the findings from interviews with farmers and other stakeholders, complemented by a review of relevant literature, with the aim of better understanding how HNVF is farmed in the Blackdown Hills AONB and key issues now and in the future.

Farm interviews

The main element was a series of interviews with a selection of farmers owning or managing farms with HNVF in the Blackdown Hills AONB. The purpose of the farm interviews was to gather information on the range of farming systems and practices which support HNVF, the farm socio-economic context and trends, use of HNVF, motivation, obstacles to managing HNVF and future trends and consequences. The farms were selected following identification of a representative sample of parishes in the Blackdown Hills AONB and the development of a HNVF farm typology for the area, see **Note 5** for more details and Figures 2-1 and 2-2 for the location of the sample parishes and farms surveyed.

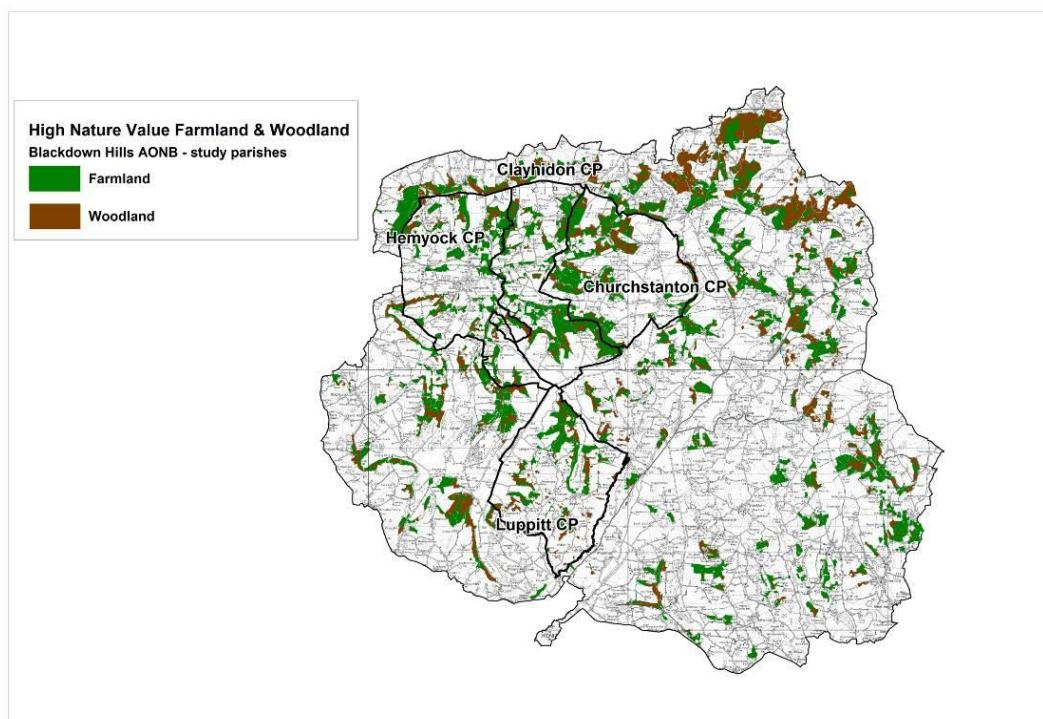


Figure 2-1: Sample Parishes in the Blackdown Hills AONB

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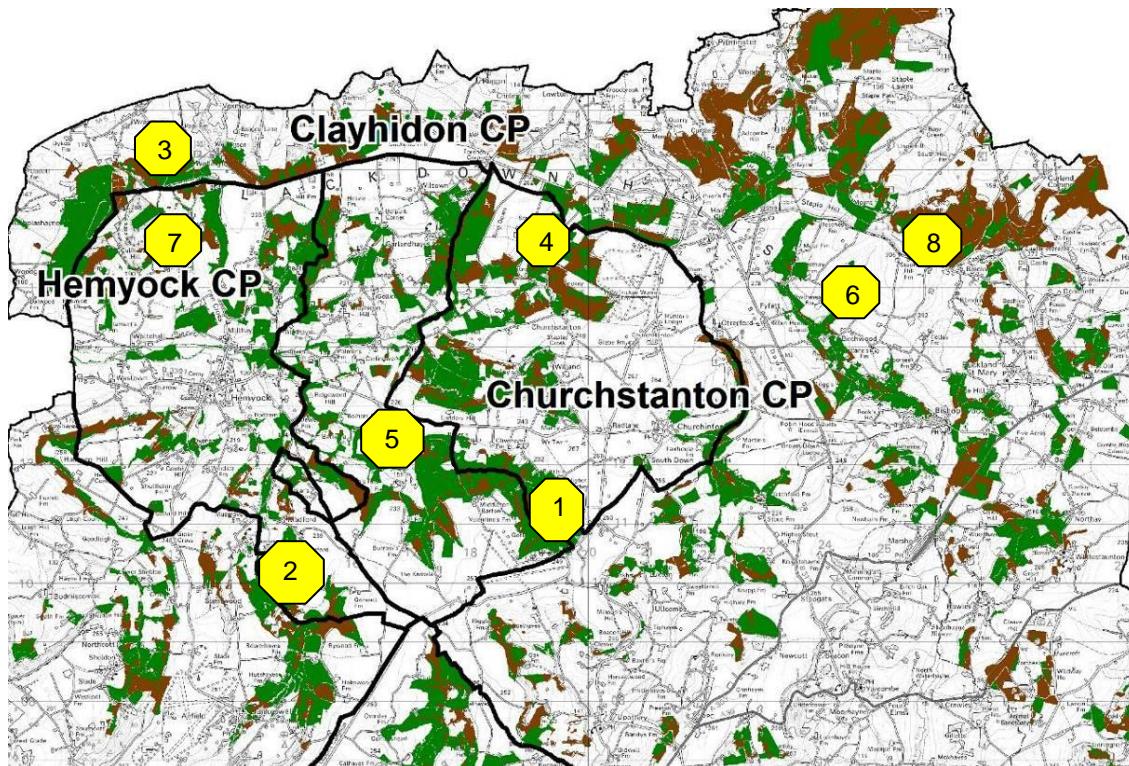


Figure 2-2: Location of Farms Surveyed

Given the relatively short time available for arranging and carrying out interviews, a pragmatic approach was taken which involved comparing the set of farm types derived in the farm typology with the map of estimated locations of HNVF, and looking for farms which fitted each of the types, and which were also already known to the interviewer. This latter factor allowed for interviews to be much more relaxed and open, and hence more extensive, than interviews based on cold-calling farmers with whom the interviewer had no existing relationship. The existing relationships which were used for this purpose stemmed from professional interactions through the Neroche Landscape Partnership Scheme³: some interviewees had received advice through the Neroche Scheme, others had taken part in community activities through Neroche, and others had been contacted as part of other Neroche activities, eg rights of way work. The authors are confident that these relationships did not have the effect of skewing or biasing the results.

Please note the tables referred to in this section - Tables A1 to A5 - are located in Appendix 1 due to their size and format.

Stakeholder interviews and additional evidence

Feedback from interviews with a range of stakeholders and additional evidence from relevant reports and studies is included under the relevant headings below. A bibliography showing reports and studies referred to is shown in Appendix 3.

³ The Neroche Landscape Partnership Scheme is a multi-purpose heritage programme funded by the Heritage Lottery Fund, led by the Forestry Commission and based with the AONB team, see Section 2.7 for more information.

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2.2 Farm descriptions

The eight farms are described in Table A1 in Appendix 1. The farms cover a reasonably typical range of livestock, dairy and mixed farms with HNV farmland in the Blackdown Hills. They include family farms, smallholdings and units owned by non-farming owners. Farm size ranges from 3ha to 270ha. There is a mix of designations (including two SSSIs and five CWS) and agri-environment scheme participation (three ELS/HLS, one ELS only, one ESA and three no agreement).

A brief summary of each farm and its HNVF is set out in Table 2-1 by way of introduction:

Farm 1 - A medium sized (103ha) family beef farm with a large, single expanse of HNVF	The farm comprises an improved grassland plateau, supporting a pedigree Limousin beef herd, together with a separate valley side with a range of semi-natural habitats. The valley side land is designated SSSI. It is historically managed by summer grazing and outwintering of light youngstock, with supplementary feeding. It is now entered into HLS, and the farmer has chosen to build up a small herd of traditional breed beef cattle (Herefords) to satisfy scheme requirements. About one third of the farm is HNVF. The farmer has known this land since childhood (his parents still live in the adjoining property) and he values it (he fondly remembers playing there as a child, damming streams), though he finds its management and the 'regulations' a headache.
Farm 2 - A small (32ha), low-intensity grassland farm managed with low inputs by a now-retired couple	The farm is a small low input grassland farm including semi-improved grassland, springline wetland and lowland meadow. Interest in wildlife has influenced the owners' management approach for many years, but following illness the grass is now all rented out, informally and at minimal rates, to neighbours. Purple moor grass & rush pasture land is summer grazed with beef cattle (though experience pre-ESA showed that grazing into early winter could also be sustained), and lowland meadow land is sheep grazed and cut for haylage. The whole farm is HNVF, because of the intimate mixture of unimproved and semi-improved grassland/mire, and woodland.
Farm 3 - A medium sized (144ha) mixed holding supporting an extended family	The farm is a medium sized mixed farm situated on the north facing scarp slope. It includes arable cropping on lower land, and a sizeable swathe of purple moor grass and rush pasture around the springline zone. This and other rough grazing on the farm, together with adjoining semi-improved grassland, has been let to a neighbour for some years, for minimal rent, just to keep it grazed – it has little relevance to the farm business. Now it is entered into HLS and continuing to let grazing, while undertaking substantial scrub clearance. The farm has a large amount of woodland which is actively managed and provides all the heating for the properties on the farm. About 40% of the farm is HNVF.
Farm 4 - A large (270ha) estate supporting a large commercial shoot	The estate land comprises a varied mixture of valley pasture and woodland, with some small parcels of semi-natural habitat, mostly purple moor grass and rush pasture. All the grazing across the in-hand estate land is let to a large grazier from outside the Blackdowns. The semi-natural habitats are run in with rest of grazing and receives light stocking with cross breed beef cattle. Tenanted land is contains similar amounts of semi-natural habitat. The estate owner had a bad experience with CSS on a tenant farm in the past, so is cautious about HLS. About 20% of the farm is HNVF.
Farm 5 - A series of small holdings (3-40ha) in a small valley	This area was once part of two larger farms which have been broken up. Most of the small holdings are owned by non-farmers, while a larger holding alongside is a commercial farm with a small dairy herd and beef stock. About one quarter of the land is semi-natural habitat, mostly in the non-farming holdings. Lowland meadow and rush pasture land near the valley bottom is regarded

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	enthusiastically by the owner of two fields, while the next door neighbour has repeatedly been trying to drain his own few fields. Land on the springline higher up the slope is largely reverted to wet woodland, but the recent owner of part of it is interested in clearing some parts back to pasture. The commercial farm up the hill takes much of the grazing on behalf of the smaller owners. The smallholdings are characterised throughout by very small field size. About 80% of the area is HNVF.
Farm 6 - a medium sized (55ha) farm with all pasture let to 3 neighbouring large dairy farms	The farm is a medium-sized grassland farm. The main farm income is now from a co-operative contracting business run jointly with four other farmers. Semi-natural habitat is confined to wet valley up middle of farm with largely scrubbed-over purple moor grass and rush pasture. This is all fenced off where scrub has taken hold: regarded as too risky for cattle to have access, and also contains the farm's water supply. The remainder of the farm is improved grassland. The farmer is not uninterested in wildlife, but sees the semi-natural areas as being too difficult and not worth the effort to bring back into grazing. The farmer has entered ELS but the semi-natural areas are probably too small to qualify for HLS. Only around 10% of the farm could be regarded as HNVF.
Farm 7 - a small (25ha) block of land belonging to a remote landowner	The farm comprises a small block of semi-improved rush pasture, together with unimproved purple moor grass and rush pasture. The owner is from the other side of the Blackdowns, and this is one of several parcels in the vicinity owned as a consequence of family bequests etc. The grazing is let to the neighbouring farm, and stocked with cross breed beef cattle. The whole area receives light grazing by default. Some scrub clearance has been done on some fields in the past few years, though the owner has not chosen to go into HLS. The whole area is HNVF.
Farm 8 - a medium sized (60ha) tenanted, beef farm on Crown-owned land on the edge of the scarp	This medium sized grassland farm is located on the edge of the scarp. The main business is a mixed breed beef herd. The lower lying land part way down the slope is SSSI, with a series of small fields supporting purple moor grass and rush pasture. These have generally been summer grazed by running them in with the rest of the farm, and the effect seems to have been positive. The cattle are overwintered outdoors on the drier land on the top of the hill. The farmer prides himself on producing high quality grass-fed beef, and regards the semi-natural areas as an accepted part of his deliberately low-intensity operation. He is mildly interested in their wildlife value, but manages them according to SSSI requirements more than out of personal enthusiasm. The land is currently going into HLS. About 50% of the farm is HNVF.

Table 2-1: Description of Farms Surveyed

2.3 HNV farmland and features

For each farm, the nature, extent, density and context of HNVF habitats and landscape features is set out in Table A2 in Appendix 1.

The predominant open-ground HNVF habitats are purple moor grass and rush pasture, grading into neutral and acid lowland meadow. There are smaller elements of lowland heath, lowland fen/mire/bog and calcareous grassland. Mixed deciduous and/or wet woodland is also extensive within these habitats, often as a result of reversion of wet pasture following the abandonment of grazing. Mire/heath and grassland communities range from larger SSSIs (eg Hense Moor, Southe & Gotleigh Moor, Blackdown & Sampford Commons) and smaller high quality semi-natural sites, through to degraded and patchy semi-improved rush pasture and improved pasture with a modestly high

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herb content. In most instances the higher quality semi-natural HNVF is buffered by progressively more improved land.

There is no simple rule for judging when semi-improved land can be classed as HNVF, and an element of subjective judgement is necessary. Generally, where semi-improved land occurs as part of a continuum between fully improved land and semi-natural land, the semi-improved is logically regarded as being part of the HNVF whole. In these situations semi-improved land will be used and influenced by some of the wildlife present on adjacent semi-natural land, and helps to buffer that higher quality land. By contrast, where semi-improved land occurs as isolated tracts surrounded by improved land (for example as a small area of steeper land in an otherwise gently sloping field, or a small corner of a larger field) it is more logical not to regard it as HNVF. Using this distinction, the proportions of HNVF on the eight farms ranges from 10% to 100%.

The predominant HNVF landscape features are thick ancient hedges on the lower valley sides, post-Enclosure hedges on the plateaux, streams, watercourses and seepages, small copses and larger woodlands. Other features include in-field trees, ponds and field margins. Five of the farms have a high density of such features, at least in part, with two farms having low density and one with medium density.

Natural England HAT data is only available for four out of the eight farms including Farms 1, 2, 6 and 8. These are scored A, D, C and A accordingly. Farms 1 and 8 score highly for biodiversity (both include SSSI land and BAP priority wetland and grassland habitats) and historic environment (both include Scheduled Ancient Monuments). Farms 2 and 6 have low scores for these elements (and appear to be marked down overall accordingly). All four farms score highly for resource protection due to their location in a priority catchment under the Catchment Sensitive Farming initiative.

2.4 Management of HNV farmland and features and link to farming system

For each of the eight farms, the farm circumstances and the management approach taken with regard to HNVF (which includes semi-natural habitats and buffering semi-improved grassland) are set out in Table A3 in Appendix 1.

On half of the farms HNVF is managed positively for conservation, on one farm as a result of the farm philosophy and in three farms as a result of the incentive provided by agri-environment schemes. On three farms, HNVF is treated without special regard to its conservation value. Farm 5 is different as the (mainly non-farming) landowners value the HNVF but do not actively farm it.

The farmers' attitude to HNVF landscape features, their management, the effect of agri-environment schemes on this management, and the relevance/integration of HNVF to the farm business is set out in Table A3. Farmer's attitudes range from very positive, to tolerant/mildly interested, to tolerant/not interested, to unaware. These attitudes generally reflect the approaches identified above. HNVF habitats are generally light-moderately summer grazed with beef or dairy cattle. For two farms, entry of the land into HLS has resulted in a positive change. For the three other farms under some form of agri-environment scheme agreement, entry into the scheme appears to have resulted in little change in management but has helped ensure continuity of management.

In terms of the relevance to or integration of the HNVF into the main farm business, only one farm (Farm 8, the tenanted beef farm) appears to integrate HNVF into the core

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(beef) enterprise. Another farm (Farm 1) is developing a separate (traditional breed beef) enterprise to manage the HNVF under HLS. Five farms rent out the grazing over the HNVF (although some non-farming landowners in Farm 5 do not actively graze the land). Farm 6 (the dairy farm) regards the HNVF as inconsequential and fences it off.

Woodland is generally not directly relevant to farming practice, and is generally managed separately for fuel (Farm 3) or game cover (Farm 4) or not at all (Farm 1).

2.5 **Benefits of farming systems and practices for nature values**

A brief summary of HNVF management and condition is set out in Table A4 in Appendix 1.

In the majority of cases, the HNVF habitats appear to be in fair to good condition (and in some cases recovering) as a result of the light-moderate summer grazing with beef or dairy cattle (approximate stocking densities range from 0.5-1 LU/ha). However on Farm 6 (the dairy farm) the HNVF is fenced off, and hence ungrazed and in declining condition. On Farm 5 (the smallholdings owned by non-farming landowners) the HNVF is mostly under- or un-grazed, albeit with pockets in good condition.

HNVF landscape features such as hedges and woodland are generally in satisfactory to good condition. Hedges are generally managed by flailing each year or every other year. On Farm 5, some hedges are unmanaged on the smaller holdings and on Farm 7 the hedges are under managed. On Farm 2, the hedges are laid on rotation. On Farms 1 and 6, the hedges are sparse but in reasonable condition. There appears to be no or minimal woodland management, with the exception of Farm 3 (managed for firewood) and Farms 3 and 6 (managed for game).

Additional evidence

A study by Devon Wildlife Trust across the Blackdowns and East Devon in 2007, assessing the need and potential for a ‘Grazing Links’ type initiative in the area, documented the condition of 69 compartments on 49 designated or proposed County Wildlife Sites (land which is by definition likely to be regarded as HNVF). This highlighted the following evidence of grassland and heathland management and site condition:

- 46% of compartments had >20% scrub or bracken cover on remaining grassland and heathland habitats.
- 13% of compartments had lost a proportion of their area to agricultural or garden improvement.
- 10% of the compartments showed signs of overgrazing. This included 3 sites where cattle were being out-wintered, causing severe poaching.
- 41% showed signs of under-grazing.
- The worst scrub problems were on wet springline and rhos pasture habitats. On drier habitats the worst problems were associated with steep slopes inaccessible to machinery. Sites with the worst problems generally lacked grazing infrastructure.
- A surprising number of compartments covered by agri-environment schemes had >20% scrub and bracken cover and/or showed signs of under-grazing. Further qualitative evidence from landowners suggested that agri-environment schemes alone are not solving problems of neglect on certain sites.

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A more recent report on County Wildlife Sites by FWAG confirmed that around 50% of the sites visited were not in favourable management and that this mainly related to abandonment, neglect or under-management as opposed to over-management, particularly on grassland/heathland sites (Stonex, 2011).

2.6 Socio-economic context of farms and HNV farmland management

The socio-economic context of each of the eight farms is set out in Table A5 in Appendix 1.

On two of the farms (Farms 4 and 7), the net cost of HNVF management is absorbed by the farm business as part of the general grazing of the area, albeit in both cases this grazing is let out (the HNVF is hence part of the “overall package”, with the graziers taking the less productive (HNVF) land alongside the more productive land). On four farms (Farms 1, 2, 3 and 8), the cost of HNVF management is met through HLS or ESA agreements, and the cost of major scrub clearance work is offset by capital payments on Farm 3. On the remaining two farms (Farms 5 and 6), HNVF is not managed and hence does not incur a cost.

On four farms (Farms 1, 2, 3 and 8) the HNVF is regarded as a net asset to their farm business, this is mainly due to the HLS payments which appear to result in a net profit from the land, but in the case of Farm 2 the HNVF is regarded as a net asset in its own right due to the owners’ personal objectives and interests. On at least one farm (Farm 1), there is recognition that profitable HNVF management is highly dependent on HLS payments.

On the two farms (Farms 4 and 7) where HNVF management is absorbed into general grazing management, the HNVF is regarded as irrelevant. On Farm 4 (the estate) it does not impact one way or other on the core business whereas on Farm 7 (the outlying block of grassland) it is arguably a burden, given the poor quality of the grazing, the small size of the holding and no agri-environment scheme payment to help offset costs. On the dairy farm (Farm 6), the HNVF land was regarded as a burden but is now considered an irrelevance. On the non-farming landowner smallholdings (Farm 5), HNVF is generally regarded as a burden or an irrelevance due to absence of management or lack of knowledge.

On none of the farms does the presence of HNVF yield any appreciable added value to the farm enterprise. This is due at least in part to the fact that none of these farms directly market their own produce, and hence the marketing opportunity of drawing attention to conservation management is not acted upon. It is worth noting that although Farm 1 has built up a small herd of traditional breed cattle to graze the SSSI/HNVF, there has been no marketing or other activity to add value to the output from the enterprise.

Examples of HNVF cost-benefits

Examples of the cost-benefits of specific HNVF approaches/practices arising on the visited farms are set out below.

The physical figures shown are based on actual data from the farms visited. The financial figures are best estimates based on evidence of regional/local income and expenditure for different items, and payment rates under national schemes.

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Table 2-2 shows the indicative economic position for Farm 2 (small, low input grassland farm), where the owner receives SPS and ELS/HLS payments (note, in reality the land on Farm 2 is entered into an ESA agreement) and the grazing (including the HNVF) is let out. The figures show a net income of £315/ha or £8,220 in total - not a bad return for modest input. The net income should continue to increase until 2012, however after that SPS payments are expected to fall.

Note, the net annual income of £315/ha is a "best case" scenario based on entry of the land into an ELS/HLS agreement. Under the existing ESA agreement, the owner is estimated to receive a net annual income of £185/ha. On expiry of the ESA agreement, if the owner was only able to get into ELS (and not HLS) then the estimated net annual income would be lower still at £145/ha (around half of the net income under the "best case" scenario).

32 ha small holding - grass keep let out			
	ha	£/ha	£/farm
Grassland (100% is HNVF)	28		
Other land (buildings, tracks, woodland etc)	4		
<i>Total area</i>	<i>32</i>		
Grass keep rent*		£50	
Single Payment Scheme		£165	
ELS/HLS Payment		£200	
<i>Total income</i>		£415	
Less costs (e.g. hedging, insurance etc)		£100	
Net income		£315	£8,220

*Grass keep is let to three graziers. A small area of the wettest purple moor grass mire area is let out rent free. £50/ha is the average over the rest.

Table 2-2: Cost-benefit: 32ha smallholding – grass keep let out

The cost-benefits associated with the decision by Farm 6 (dairy farm) to fence off a small area (3 ha) of HNVF are illustrated in Table 2-3. The net return on the land under the current position is £145/ha. By grazing the land – assuming a suitable grazier can be found to graze the land for no payment – the return rises to £265/ha primarily on the basis of improved ELS income (assuming more points could be 'stacked' on the land). This change would yield a modest, but positive, additional income of £240. More still could be gained by entering the HNVF into HLS (assuming the small area would qualify).

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55 ha dairy farm - HNVF area fenced off			
	ha	£/ha	£/farm
HNVF (purple moor grass/scrub)	3		
Other land	52		
Total area	55		
Current (fenced off)			
Single Payment Scheme		£165	
ELS Payment*		£30	
Total income		£195	
Less costs (periodic cutting**)		£50	
Net income		£145	£435
Alternative (grazed - assuming suitable grazier can be found)			
Grass keep rent***		£0	
Single Payment Scheme		£165	
ELS/HLS Payment*		£150	
Total income		£315	
Less costs (fence/water repairs, some cutting)	£50		
Net income		£265	£795
Difference			£360

* ELS payment under 'current' is basic average area payment. ELS payment under 'alternative' assumes EK3 under ELS (and release of points from elsewhere on farm) but could be more under HLS.

** Periodic cutting required to satisfy cross compliance conditions

*** Grass keep rent for very small, difficult, 100% HNVF area is assumed to be nil

Table 2-3: Cost-benefit: 55ha dairy farm – HNVF area fenced off

The economic advantages of integrating HNVF grazing into the farm system as opposed to letting out the grazing are shown in Table 2-4. This reflects the position for Farm 8, the 60ha beef farm. Under the current system, the farm incurs some additional costs (vaccinations against red water, liver fluke etc.) but gains the full grazing value of the land. If the farm were to let out the grazing, net income would be reduced by £30/ha or £540 in total. The farm would also lose control of the management of the land and incur animal health risks by allowing a third party's livestock onto the farm.

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60 ha beef farm - HNVF integrated			
	ha	£/ha	£/farm
HNVF (purple moor grass/acid grassland)	18		
Other land (mainly grassland)	42		
Total area	60		
Current (integrated)			
HNVF grazing value*		£100	
Single Payment Scheme		£165	
ELS/HLS Payment		£200	
Total income		£465	
Less costs (periodic scrub control, additional vaccinations)		£50	
Net income		£415	£7,470
Alternative (grass keep)			
Grass keep rent*		£50	
Single Payment Scheme		£165	
ELS/HLS Payment		£200	
Total income		£415	
Less costs (periodic scrub control)		£30	
Net income		£385	£6,930
Difference			-£540

* Grazing value of HNVF assumed to be double rental value which is taken to be £50/ha (£20/ac) for block of land this size and quality.

Table 2-4: Cost-benefit: 60ha beef farm – HNVF integrated

Additional evidence

The farm business income evidence presented in Section 1.4 indicates poor profitability for lowland livestock farms (5-6 of the farms surveyed) with FBI in the Blackdown Hills likely to be lower than the SW average for 2008/9 of £17,668 due to farm size, lower productivity etc. This income is highly dependent on SPS (73%) and to a lesser extent diversification (20%) and agri-environment schemes (18%), with agricultural output accounting for -10% of FBI. This underlines the economic importance for these farms of maximising subsidy receipts from SPS and agri-environment scheme payments. The barriers to entry into agri-environment schemes are explored further in Section 5.6 below. Dairy farms on the other hand are much less dependent on SPS (28%) and only obtain 3% of FBI from agri-environment payments and 1% of FBI from diversification.

Other anecdotal socio-economic evidence gained from stakeholder interviews in relation to the Blackdown Hills includes the following:

- There is a wider social mix of farmers and landowners in the Blackdown Hills than in many other parts of the country. These include modern commercial farmers, more conservative traditional farmers, and non-farming landowners (which include 'good-lifers' and 'lifestyle' farmers).
- The area has predominately retained traditional approaches and practices. This in turn has attracted incomers with alternative ways of thinking, and hence produced the range of different types of farmers and landowners now present.
- The incomers have purchased existing smallholdings in the valleys or valley sides, which is the land most associated with HNVF. Average farm size is small

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and these holdings together make up a relatively small (but important in terms of HNVF) proportion of the total AONB area.

- Grass letting is reasonably active and includes both older farmers looking to reduce their workload as well as smallholders without livestock or machinery (see below).
- Diversification is possibly rather less developed than other parts of the SW region, with exceptions.

Grass keep and HNV farmland in the Blackdown Hills

Based on interviews with agents and farmers together with anecdotal evidence, grass keep plays an important role in delivering grazing management to HNVF in the Blackdown Hills AONB. Grass keep is typically let out by semi-retired or retired farmers, although a proportion of non farming landowners also rely on it. The average area of grass keep tends to be fairly low, i.e. under 20 ha (50 acres). There is a ready demand for grass keep from commercial livestock and dairy farmers, particularly those with smaller holdings wishing to increase their acreage. There appear to be few specialist conservation graziers. Productive grassland is valued most, with rents ranging from £100-250/ha (£40-100/acre). Less productive grassland, including land with a higher proportion of semi-natural habitat and/or in agri-environment schemes rents out from £25-125/ha (£10-50/acre) depending on size, productivity, restrictions etc. Small, isolated pockets of very poor land (often of high nature value) may be let out for free. Usually, the landowner receives the SPS income and, where available, agri-environment scheme payments.

2.7 Obstacles to managing HNV farmland

In order to maintain and manage HNVF, basic needs - from a farmer's perspective - include the availability of suitable livestock and suitably qualified labour and sufficient returns to cover costs and generate an element of profit.

A range of obstacles to managing HNVF were identified from the farms visited; to a degree, these reflect the extent to which basic needs are being met in the Blackdown Hills but also highlight a number of other problematic issues:

Interest and awareness

- Lack of interest in, or desire to enhance, the conservation value of HNVF (Farm 7).
- Lack of awareness of the conservation value of HNVF and lack of knowledge in terms of appropriate management and how to implement this. This particularly applies to the non-farming landowners (Farm 5).

Practicalities

- Irrelevance of HNVF to the core farming business, or grass keep arrangements. This is associated with no management or under management of HNV grassland.
- Reliance on neighbours or others to graze HNVF via grass keep arrangements (five farms). Aside from the fact that these graziers could give up this grazing at any time, this also introduces a disconnection between the owner and the manager of the HNVF. For the grazier, the land is usually rented for a minimal sum and without the benefit of SPS or agri-environment scheme payments, and hence is probably a relatively low priority in terms of attention and effort. Where larger blocks of land are let out, HNVF land is often a small part of this, so again it is likely to be relatively low priority.

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- HNVF is considered too marginal and too risky for animal health and welfare on land let out for grazing by dairy cattle (Farm 6), and hence is fenced off.
- No or insufficient management of hedges and woodland due to cost, time etc.

Schemes

- Cautiousness about entering into HLS, given previous bad experience with CSS (Farm 4).
- HNVF areas being too small (e.g. under 2 ha) to qualify for HLS and hence brought back into management (Farm 6)
- Concern over how onerous agri-environment scheme prescriptions may be (Farms 1 and 2).

Additional evidence

DWT (2007) also documented a number of obstacles/concerns expressed by farmers and graziers in respect of managing HNVF.

Grazing

A range of concerns were expressed regarding the stocking of HNVF around the springline:

- Doubt that animals will gain weight on this ground, hence this land seen as only suitable for store cattle.
- Risk of red water disease (babesiosis – tick-borne parasite)
- Risk of New Forest eye (bacterial infection associated with high numbers of flying insects)
- Liver fluke
- Foot injuries
- Bracken poisoning
- Tick fever
- Summer mastitis

Where HNVF on the springline is being successfully managed, the strategies being followed include:

- High stocking rates for short periods to minimise adverse effects on livestock performance
- Very low stocking rates for a longer season, including winter stocking of dry heath sites
- Limiting grazing to the summer period to make best use of palatable forage and minimise risks from wet ground
- Supplementary feeding on site
- ‘Standing room’ for dry cows, stores or young stock
- Preferred stocking with native breeds (where these are regarded as hardy enough for the ground, and/or regarded as prone to getting too fat if kept on improved grassland alone).

The DWT study identified a degree of interest amongst potential graziers in taking on new sites, but this is dependent upon factors such as adequate infrastructure and payment for grazing.

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Scrub and bracken control

A range of concerns were also expressed regarding scrub and bracken management:

- Landowners struggled to keep on top of scrub and bracken on steep and/or wet sites inaccessible to machinery.
- The incentives for clearing scrub and bracken on difficult sites were too low to make continued management attractive.
- Few landowners used burning as a tool for keeping scrub under control.
- Grant schemes have treated scrub and bracken control as a capital cost and this has led landowners and conservationists to view it as something of a one-off activity rather than an on-going part of modern management.

In contrast, well managed sites encountered were cut or burnt occasionally as well as grazed.

Landowner advice and support

Landowners surveyed by DWT indicated the following:

- 50% of landowners would like more advice on land management for conservation. This included significant demand for advice on Environmental Stewardship amongst commercial farmers.
- 27% of landowners would like help finding a grazier. These were mainly public landowners, non-farming landowners or smallholders, as opposed to commercial farmers. However this demand is linked to related problems such as difficult sites, lack of grazing infrastructure, small sites and scrub control.
- That said there is a degree of scepticism amongst the landowning and livestock owning community directed towards Defra, Natural England and conservation organisations. There is also a degree of scepticism about the feasibility of managing the rougher and wetter habitats such as springline mire.

Scheme participation

There is also evidence from a number of studies concerning relatively poor participation in agri-environment schemes in the Blackdown Hills. ELS showed relatively poor take-up in the Blackdowns in the early period of that scheme, reflecting a previous below-average uptake of the ESA scheme. This could be taken as suggesting that farmers do not place enough value on the features which ELS can support, or do not have enough of these features to be able to amass the points (30 points per ha) needed to qualify for ELS. Carver Knowles (2008) made the following comments regarding poor uptake:

- As a farming area, the Blackdown Hills is very resistant to entering the ELS and in particular, smaller intensive dairy farmers regarded the ELS as incompatible with their farming systems.
- Many farmers bemoaned the lack of capital options under ELS for management of hedges. Farmers clearly wished to manage their hedgerows traditionally through hedge laying in many instances, but the costs were prohibitive without capital support (as had previously been provided through the ESA). This suggests that for many farmers, the dense matrix of hedgerows which provide HNVF features remains valued and relevant to the farm enterprise.

Agri-BIP work (2010) commented that the main reasons given by farmers for not wishing to join the ELS scheme were either:

- That they were not willing to take on more regulation and constraints, or
- That they were too intensive, and who did not wish to consider entering hedgerow options or to farm in a more extensive manner on areas of their farm.

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Field experience gained by FWAG in the East Devon AONB (Stonex, 2007) suggests that cultural/sociological 'attitude' factors play a significant part in landowners not joining ELS/OELS with a significant number of landowners being fed up with government interference/inspections, paperwork and restrictions on farming practice. Anecdotal evidence suggests that similar attitudes may be common in the Blackdown Hills AONB.

Current limitations of Higher Level Stewardship scheme

There have been some additional project-based measures in the Blackdown Hills in recent years designed to enhance and encourage better management of HNVF. The Neroche Landscape Partnership Scheme (a multi-purpose heritage programme funded by the Heritage Lottery Fund, led by the Forestry Commission and based with the AONB team www.nerochescheme.org) included a major habitat restoration programme inside the public forest estate. This enabled the removal of conifer plantation from over 200ha and the establishment of woodland grazing using a herd of Longhorn cattle owned by the partnership and managed by local graziers. In addition the Neroche Scheme was able to fund a modest programme of conservation advice across the northern half of the AONB, delivered by Somerset Wildlife Trust and FWAG.

However, the need remained for a more concerted programme of conservation advice and capacity-building within the farming sector in the Hills. Using experience gained during the Neroche Scheme a new initiative, entitled 'Beef & Butterflies', was devised to co-ordinate the management of small areas of rough grazing to improve their wildlife potential. The ethos of this project idea was not simply to deliver external advice and facilitate new HLS applications, but to encourage sharing of experience and more collaborative working between land managers.

The funding mechanism for the project relied on a Special Project through HLS, combined with a grant through the 'Making it Local' programme (Local Action for Rural Communities element of RDPE). Unfortunately due to the reduction in resources available for HLS after the Comprehensive Spending Review (October 2010), the offer of the Special Project element was withdrawn by Natural England. The 'Making it Local' element remains, and will finance a part-time post to pursue the original aims of the project for a 3-year period from Spring 2011.

The prospective limits in the HLS budget will make it harder to make progress in this area. It is estimated that over the next two years, to the end of RDPE programme, there may only be resources for some 3 to 4 new HLS agreements within the Blackdown Hills. This will have serious implications in the short to medium term for achieving suitable management of HNV farmland in the area.

2.8 Future trends and consequences for nature values

Future trends in the interviewed farmers' approach to HNVF and the potential vulnerability of HNVF as a result of these trends are set out in Table A5 in Appendix 1.

The owners of Farm 2 (small, low input grassland farm) are committed to the conservation of the HNVF so it should be secure for as long as it remains in their ownership. That said, there is uncertainty attached to the transition between the end of the current ESA agreement and the start of a new ELS and/or ELS/HLS agreement. To a large extent this is outside the owners' control and will be dependent on Natural England's budget and priorities at the time. If a HLS agreement was not available, this

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would significantly reduce the income receivable and could affect the way in which the HNVF is managed.

For the three farms in HLS (Farms 1, 3 and 8) the scheme should secure consistent, positive management of HNVF for the remainder of the agreement term. The future beyond that is less clear, although on two of the farms, there are potentially sustainable beef enterprises and the added protection of SSSI designation over part of the land. The owners of the other farm (Farm 3) are not reliant on income from HNVF so it should be secure in the medium term.

HNVF on Farm 4 (mixed estate) is likely to be maintained, and enhanced management (such as a more refined grazing regime) could be achieved by encouraging entry into HLS. Similarly HNVF on Farm 7 (outlying block of grassland) is likely to be maintained via grazing under a grass keep arrangement although there appears to be little interest in enhancing its value.

HNVF management on the remaining two farms is at best uncertain. On Farm 5, it is dependent on decisions by a number of different owners and access to good advice. On Farm 6 (dairy farm), HNVF may well continue unmanaged as it is too small to qualify for HLS.

The management of HNVF landscape features such as hedges is likely to be generally static or improving. The exception is Farm 5, where lack of active management may result in continuing deterioration.

In terms of the vulnerability of HNVF in light of the above trends, Farm 2 is secure for the remainder of the current (elderly) owners' time and the three farms in HLS (Farms 1, 3 and 8) are fairly secure in the short term (10 years). Three other farms are more vulnerable, two (Farms 4 and 7) to changes in the grazing tenants' approach and one (Farm 5) to different individuals' preferences and abilities. HNVF on the last farm (Farm 6) is in declining condition but the owner could be open to advice.

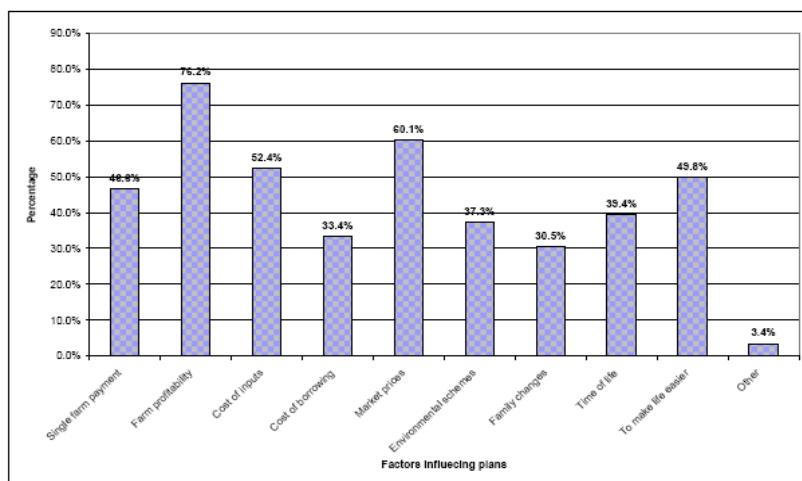
Additional evidence

There is a range of additional evidence available from studies and stakeholder interviews which provide some indication of future trends for farms with HNVF. Butler et al (2007) undertook a postal survey of 598 Devon farmers in late 2006 in part to ascertain farmer intentions and drivers of future plans. Key findings relevant to this study (albeit from a now dated survey) were as follows:

- 82.1% of farms will continue under the management of the same family over the next five years. This includes 62.9% of who intend to be managing their farm as they are now or with increased production or increased diversification activities and a proportion who intend to retire or semi-retire and have identified a successor to take over the family business. In the Blackdown Hills, anecdotal evidence would suggest there is a significant cohort of older farmers with no successors, this may link into smaller farm size (and hence reduced economic viability of farms for the next generation).
- A minority of dairy farms (29.6%) account for the majority of expansion plans of all farmers in the survey. On the other hand, over one-third (36.5%) of cattle and sheep farmers intend to reduce their level of farming either through semi-retirement or increasing off-farm work, which may be partly due to the removal of headage payments and historically low livestock prices of recent years. This latter finding is particularly relevant to Blackdown Hills farms with HNVF.

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- 30.7% of farms will increase livestock numbers but conversely 24.8% will reduce numbers. This reflects gradual structural adjustment in the sector.
- The majority (76.2%) of Devon farmers consider farm profitability to be the main influencing factor affecting future farm plans. This includes agricultural enterprises, as well as schemes and other activities. Other factors include market prices (60.1%), cost of inputs (52.4%), 'to make life easier' (49.8%), SPS (46.6%), time of life (39.4%) and environmental schemes (37.3%), see Figure 2-3.



Source: Butler et al (2007) using Devon sample from SW farm survey CRPR 2006

Figure 2-3: Factors that influence farm planning

Aside from farmer views, it is important to note the following general trends and drivers likely to affect farming and land management in the Blackdown Hills. These are based on a review of various studies and reports including Cumulus (2007) and Andersons (2010):

- **Market volatility.** There is likely to continue to be market volatility as both dairy products and beef are influenced by a range of global, European and domestic factors. After a difficult 2009, dairy farmers are becoming increasingly confident with dedicated supply chains and recent better prices. Most dairy farmers (75%) plan to stay in the sector for the next ten years and many will invest and expand (Dairy Co (2010) Farmer Intentions Survey). Beef farmers have experienced fairly stable prices recently and no real change in profitability, although for most this profit is highly dependent on SPS income. In the medium term, 'Mercosur' trade talks could result in downward pressure on beef prices. In the meantime, no significant increase or decrease in the size of the beef herd is expected locally.
- **Local markets.** There continues to be an interest from consumers in locally-sourced food. A recent survey of 1000 shoppers in the UK by IGD (IGD (2010) Shopper Trends Report, see article on www.thefoodnetwork.co.uk) showed 30% had specifically bought local food in the last month (up from 15% in 2006) and 54% said they wanted to support local producers (up from 28%). This would suggest a continued place for the production and marketing of local foods even in the current recession - "*shoppers are looking for both value and values*".
- **Input prices.** Prices of inputs such as fertilisers and fuel are expected to continue to increase gradually over the years ahead, indicating continued need to make efficiencies to maintain profitability.

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- **Single Payment.** The regional average payment is expected to increase to around £220/ha by 2012. Thereafter, CAP reform can be expected to result in a reduction in and re-targeting of support payments (possibly linked to the delivery of public goods / ecosystem services). Some estimate that the average Single Payment could be halved by 2020, although land of high environmental value could be protected from the worst of the cuts.
- **Agri-environment Schemes.** Environmental Stewardship will continue however it seems inevitable that it will be under budgetary pressure in the future. Existing ELS and HLS agreements are probably secure for the remainder of their agreement term, but prospects for new HLS agreements in terms of number and total payments are likely to be more limited up to the end of 2012 and beyond. There is no absolute guarantee the scheme will be available in any RDPE after 2013.
- **Other rural development expenditure** is similarly likely to be curtailed over the remainder of the 2007-2013 period, reducing investment in farm business, farm diversification and rural community projects.
- **Exchange rate.** A weak sterling over the past two years has benefited farming via improved export prospects and increased support payments. This may change if the pound strengthens (as a result of current government policies and the performance of the economy), with a resultant reduction having an adverse impact on farm profitability.
- **Animal health and welfare.** TB and other animal diseases will continue to adversely affect livestock farming in the SW (including the Blackdown Hills) both in terms of profitability and confidence.
- **Climate change.** In the medium-long term, livestock producers in the county will need to adapt to warmer summers and winters, reduced summer rainfall, more heavy rainfall events and a generally less predictable climate. These changes may result in changes in stock types, reduced stocking rates, different grazing regimes and changes in forage crops grown.
- **Land market/land values.** In general, agricultural land values are expected to increase over the next few years on the back of growing population, demand for food and other products from the land, and rising commodity prices (Savills (2010) Agricultural Land Market Survey 2010). This will apply in the Blackdown Hills as elsewhere. The attractiveness of the area to non-farming landowners also seems likely to continue.
- **General economic circumstances.** Reduced public expenditure, reduced consumption of certain goods and services, and increased unemployment could all adversely affect income from on-farm diversified enterprises and off-farm income, reducing farm profitability.

If these trends are applied to HNVF in the Blackdown Hills, key points about the future to highlight include the following:

- The prospects for dairy and beef farms which support HNVF are uncertain in the short term, although the underlying trends for agriculture in terms of commodity and local markets are generally positive in the medium-long term.
- Commercial dairy farms, and to a much lesser extent commercial beef farms, look set to continue to invest and potentially expand individual herds. This should mean a continued supply of commercial graziers for HNVF.
- Beef and sheep farms are particularly vulnerable to a decrease in SPS income over the next CAP period to 2020, and also a reduction in agri-environment scheme and diversification income. This is likely adversely to affect farm profitability resulting in further restructuring (ie. fewer farmers and farms being responsible for the grazing of more land).

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- Livestock numbers are vulnerable not only to underlying enterprise profitability but also animal disease risks.
- Traditional breed livestock appear likely to continue to play a small, but important part in grazing in the Blackdown Hills.
- Environmental outcomes will be dependent, to an extent, on the continued availability of agri-environment scheme income. However future budget cuts could limit the area under HLS in particular.
- The current trend of retired/semi-retired farmers letting out their grazing seems set to continue.
- The sale of smaller units to non-farming landowners and larger blocks to commercial farmers also seems likely to continue.
- The increasing polarisation of between large farms highly dependent on agriculture as an income source and groups of smaller farms where agricultural income is supplemented by a variety of sources such as pensions, rental income and income from diversification and off-farm working, appears to apply as much in the Blackdown Hills as it does elsewhere in Devon.

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3 Conclusions

Our conclusions from this case study are as follows:

- HNV farmland and woodland are estimated to cover 5,974 ha or 16.2% of the Blackdown Hills AONB. This includes a mosaic of habitats and landscape features such as purple moor grass and rush pasture, lowland fen/mire/bog, lowland meadow, lowland heathland, (buffering and linking) semi-improved grassland, hedges, mixed deciduous woodland, wet woodland and watercourses. 62% of this HNV land is designated SSSI or CWS and 46% of HNV farmland is under some form of agri-environment scheme (mainly Environmental Stewardship). This compares with over 50% for all AONB farmland.
- HNVF occurs in a spectrum of farming situations. The farms surveyed represent this range, including very small holdings with a high proportion of HNVF owned by non-farming landowners, through to larger holdings managed by commercial farmers, with only a small area of HNVF. Even on the most habitat-rich holdings, HNVF is usually only a component of the farm; there were no farms surveyed which entirely comprised of semi-natural vegetation. HNVF varied from 10% to 100% of total farm area on those farms visited. Overall, the data suggest that lowland livestock and non-commercial (“other” category) farms are much more likely than other farm categories to have a large proportion under HNVF. The same applies to smaller compared with larger holdings.
- HNVF is generally regarded by the farmers surveyed as being secondary/Peripheral to their business, except for the few situations where personal interest/motivation makes it more central. That said, half of the farmers surveyed consider their HNVF to be a net asset, although this is mainly due to the agri-environment scheme payments received for it. The remainder regard it as an irrelevance or a burden. None of the farms surveyed currently use HNVF to help add value when marketing their produce or enterprises (e.g. meat box schemes, on-farm tourism), although there is certainly potential to do this in the Blackdown Hills AONB.
- HNVF management is influenced by the dairy, beef rearing and finishing, and sheep systems which predominate in the Blackdown Hills AONB, these being run in-hand or by graziers. In the majority of the farms visited, HNVF habitats are in fair to good condition as a result of light-moderate summer grazing and HNVF landscape features such as hedges are in satisfactory to good condition. On two farms visited, HNVF habitat is in poor or deteriorating condition as it is under- or ungrazed, or HNVF landscape features are undermanaged. Evidence from other studies (DWT, 2007 & Stonex, 2011) suggests that 50% of HNVF on CWS is in unfavourable condition.
- Management problems such as overgrazing, undergrazing, scrub and bracken encroachment and agricultural improvement continue to persist despite designation as a CWS and/or participation in an agri-environment scheme (DWT, 2007). However under-management is more of a threat than over-management.
- Farm business profitability for many farms with HNVF in the Blackdown Hills AONB is poor and highly dependent on SPS income. This is a reflection of farm type, small average farm size and low productivity land. Lowland grazing (beef and sheep) farms

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in particular will be vulnerable to subsidy cuts which are expected to occur as part of CAP reform from 2013 onwards. All commercial farms with HNVF (including dairy, beef and sheep, and mixed farms) are subject to financial pressures arising from (often short term) market volatility; this affects output and input prices, profitability and ultimately land use and land management decisions.

- The profitability of HNVF management *per se* is potentially positive, but only as a result of SPS and agri-environment scheme income. This is positive in the sense that it shows that policy is having an important effect, where it provides the required support. However, only 11% of HNV farmland in the Blackdown Hills is currently engaged in HLS. Also, agri-environment schemes are enabling HNVF management only on an artificial, temporary basis which may not be sustainable after the end of an agreement. Reduced income from SPS and agri-environment schemes could lead to a change of management of HNVF. This is likely to have mainly negative impacts arising from abandonment, under management and potentially in some cases intensification.
- Aside from financial pressures, there is a range of other obstacles to managing HNVF. These include lack of interest and awareness, lack of control arising from reliance on neighbouring graziers, animal health and welfare concerns, and eligibility for and the commitments involved with HLS (this includes the ineligibility of small areas of semi-natural habitat for entry into the scheme).
- Key policy messages from the case study include the following:
 - There is still a lack of awareness, acceptance and appreciation of the value of HNVF by some farmers and landowners in the Blackdown Hills; there is a continued need for advice, guidance and encouragement.
 - The poor profitability of farming in the Blackdown Hills is a key threat to HNVF condition and management. This reflects the relatively small farms, less productive land, and smaller grass-based enterprises in the area. The profitability of many farms with HNVF is highly dependent on SPS and agri-environment scheme income and vulnerable to changes in scheme design and payment rates.
 - SPS will evolve with CAP reform, but where farms provide valuable public benefits via HNVF management, scheme payments should be sustained to avoid significant, adverse effects on farm profitability and hence HNVF management.
 - Agri-environment schemes are positive in that they direct and support HNVF management but they could be improved. ELS/HLS rules do not cover the wide range of situations where HNVF occurs in the Blackdown Hills (e.g. small areas on more intensive farms, smallholdings owned by non-farming landowners etc.). There is a need to overcome the poor perception of agri-environment schemes and low uptake by farmers in the area. This could be helped by a more flexible approach in terms of eligibility, prescriptions and delivery; and should result in the positive management of more HNVF.
 - Ecosystem services provide an opportunity for additional/alternative income sources for HNVF; however appropriate payment mechanisms and markets need to be developed.

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- More could also be done to encourage farmers to meld/harmonise HNVF management into their wider enterprises and to add value to these enterprises to improve long term sustainability.
- HNVF management, including that supported by agri-environment schemes, appears to be happening in isolation. There is little mutual awareness and networking between farmers and limited advisory provision to put people in touch with one another to share experience. In the future, collaboration is likely to be increasingly important as more land, including HNVF, passes into the hands of non-farming landowners and/or retired farmers. It could also help overcome other obstacles associated with HNVF e.g. animal health and welfare concerns.

The implications of these findings for policy and for future conservation of HNVF will be developed in the report for Phase 3 of this project.

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Appendix 1: Farm Interview Findings – Summary Tables

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Farm 6	Farm 7	Farm 8
Categorisation	Medium sized Commercial Beef Family farm	Small Low-input Beef & sheep Retired couple	Medium sized Mixed livestock, cropping and woodland Family farm	Larger estate Mixed livestock and woodland	Several small- holdings Livestock Non-farming landowners	Medium sized Commercial Dairying Family farm	Small Beef & sheep Remote holding	Medium sized Commercial Beef Family farm
Holding area /ha	103	32	144	270	3 to 40 – 85 in total	55	25	60
Tenure	Freehold	Freehold	Freehold	Freehold	Freehold	Freehold	Freehold	Rented
Enterprises	Pedigree beef	Rented-out grazing and silage	Woodland Game rearing Rented-out grazing and arable Off-farm contracting	Rented-out grazing Commercial shoot Tenancies Woodland	Beef & sheep Rented-out grazing	All rented to neighbouring dairy farms Off-farm contracting	Rented out grazing	Beef & sheep
Designations	Part SSSI	Part CWS	Part CWS	Part CWS	Part CWS	None	CWS	Part SSSI
Agri-env participation	HLS	ESA	HLS	None	None	ELS	None	HLS

Table A1: Description of Sample Farms

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	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Farm 6	Farm 7	Farm 8
HNVF habitats⁴	<ul style="list-style-type: none"> Purple moor grass & rush pasture Lowland heath Lowland fen/mire/bog Wet woodland 	<ul style="list-style-type: none"> Purple moor grass & rush pasture Lowland meadow Mixed decid woodland S/I grassland 	<ul style="list-style-type: none"> Purple moor grass & rush pasture Lowland heath Acid grassland Mixed decid woodland S/I grassland 	<ul style="list-style-type: none"> Purple moor grass & rush pasture Lowland meadow Mixed decid woodland S/I grassland 	<ul style="list-style-type: none"> Purple moor grass & rush pasture Lowland meadow Wet woodland Mixed decid woodland S/I grassland 	<ul style="list-style-type: none"> Purple moor grass & rush pasture Wet woodland Mixed decid woodland 	<ul style="list-style-type: none"> Purple moor grass & rush pasture Wet woodland S/I rush pasture 	<ul style="list-style-type: none"> Purple moor grass & rush pasture Acid grassland Mixed decid woodland S/I rush pasture
HNVF habitats as % of farm	30%	100%	40%	20%	80%	10%	100%	50%
Context of HNVF – S/I land⁵	Habitats are starkly separated from otherwise improved land, with very little S/I	Almost all other land is effectively S/I	Habitats are largely buffered by S/I and woodland	Frequent S/I rush pasture on slopes, buffering other habitats	Almost all valley side land outside habitat patches is S/I	Small valley through middle of farm with remainder improved grassland	Most of rest of farm is S/I rush pasture.	1/3 of the farm qualifies as S/I, some rush pasture, gorse heath.
HNVF landscape features	19 th century Enclosure hedges Stream valley	Ancient hedges Copses Stream valley	Ancient hedges Large woodlands In-field trees Ponds Field margins	Ancient and 19 th century hedges Various watercourses Lakes Coverts, larger woodlands	Ancient hedges, Copses and larger woodlands Stream valley	Ancient and 19 th century hedges Copses Various watercourses Ponds Field margins	Ancient, thick hedges Copses Small stream	Ancient and 19 th century hedges Copses
Density of HNVF landscape features⁶	Low density in improved plateau part of farm	High density, small field size	High density if taken in conjunction with woodland features	Variable – high density on valley sides, low density on plateau	High density – very small field size	Generally large field size, low density	High density	Medium density

Table A2: HNV Farmland and Features on Sample Farms

⁴ Habitat composition of main areas of semi-natural vegetation on the farm

⁵ Are the semi-natural habitats in isolation amongst improved land, or is there a 'buffer' of semi-improved (S/I) land around them – a progression from semi-natural, through semi-improved, to improved?

⁶ Higher density of HNVF features suggests greater ecological connectivity across the holding

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	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Farm 6	Farm 7	Farm 8
Attitude to HNVF habitats	Tolerant and cautiously positive	Very positive and interested	Positive and proud of wildlife, but led by HLS incentive rather than deep knowledge	Not really aware. Cautiously interested in HLS though bad experience of CSS in past	Range from interested but with little knowledge, through to unaware	Regards HNVF as too boggy to allow stock access. Some areas reclaimed but tends to revert	Tolerant but not interested	Farms springline land with toleration and mild interest
Attitude to HNVF landscape features	Conventional flail management of hedges	Very positive and interested. Uses BTCV to get hedges laid	Conventional flail management of hedges with some laying	All hedge management done by contractor, flailed	Varied attitude, but little active traditional management of hedges – many overgrown	Maintains hedges well, though many were grubbed 20 years ago. Got ELS easily	Maintenance management of hedges where they spread into grazing land, but little active mgt	Traditional attitude to good hedgerow management
Method of management	Light summer grazing with Herefords and South Devon X's	Light summer grazing with Dexters and sheep	Light grazing with cross-breed beef cattle	Light grazing with cross-breed beef cattle and sheep	Some light grazing with cross-breed beef cattle	Moderate grazing with dairy cattle	Summer grazed with cross-breed beef cattle	Summer grazing with cross-breed beef cattle
Effect of a-e scheme	Entry into HLS has caused the move into Herefords, specifically to graze HNVF areas. Some nervousness about HLS prescriptions	Management has remained the same following entry into ESA. Cut-off autumn date for grazing under ESA is seen as too rigid	Entry into HLS has initiated substantial scrub control, but grazing pattern little affected	No agreement as yet	No agreements as yet	Basic maintenance for ELS payments	No agreement as yet	Entering into HLS – requirements unlikely to change significantly
Relevance to/integration with main farm business	Under HLS, HNVF being managed through a separate small traditional breed beef herd, distinct from the core pedigree beef business	All grazing now rented out. Maintaining environmental quality is a key objective of the owners	Using HLS to deal with previous scrub problem, but resulting HNVF grazing is still being rented out for minimal income	HNVF is an inconsequential element of a large area of let grazing, not beneficial but not problematic enough to need to deal with	HNVF provides a small amount of rented grazing for one farm, but other holdings do not actively farm	HNVF is an inconsequential element of a large area of grazing, minimised and fenced out	Grazing is let to keep the land in decent condition, simply providing some rather poor additional grazing for a neighbour	Under HLS the previous benign regime is being continued, with HNVF forming part of a continuum of grazing land occupied by the core beef herd

Table A3: Farmer attitude to HNVF, management, scheme effect and relevance to farm business on Sample Farms

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	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Farm 6	Farm 7	Farm 8
HNVF habitats								
Stocking level	Light, c.0.4 LU/ha, prescribed by HLS	Light, prescribed by ESA. 0.4-1.0 LU/ha (springline mire - dry neutral grassland)	Light, c.0.4 LU/ha prescribed by HLS.	Light to moderate, run in with rest of improved grazing, c.1.0 LU/ha	0-1.0 LU/ha, depending on field.	Fenced out of grazing, 0 LU/ha.	Light, variable c0.5 LU/ha	Light to moderate, c.1.0/ha prescribed by HLS
Timing of grazing	Summer	Summer	Summer	Spring, summer autumn	Summer	None	Spring, summer, autumn	Year round
Resulting condition of HNVF habitats	Largely favourable, some scrub areas unfavourable-recovering	Good condition	Previously moderately scrubbed up, now recovering	Fair condition, as by-product of wider general stocking	Mostly undergrazed or ungrazed, still retaining good pockets	Ungrazed and declining	Fair condition, as by-product of wider general stocking	Good condition
HNVF landscape features								
Management of linear features	Flailing, mostly every other year	Hedges layed on rotation	Flailing every other year, and some restoration coppicing	Flailing, some annual some less regular	Variable, unmanaged on smaller holdings, flailed on larger farm	Flailed every other year	Irregular cutting back	Flailing every other year
Woodland	Minimal	Minimally managed for conservation	Carefully structured management to yield firewood for domestic use	Mostly cover for game rearing	Unmanaged	Small area, used as cover for game rearing	None	Small areas, unmanaged
Resulting condition of HNVF landscape features	Sparse but ok	Thick hedges, good condition, rich woodland	High value well managed woodland, thick hedges	Diverse range of features, generally good condition	Under-managed but dense due to very small field size	Sparse but ok	Under-managed but thick hedges	Well managed

Table A4: HNV Management Prescriptions and Condition on Sample Farms

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	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Farm 6	Farm 7	Farm 8
HNVF habitats								
HNVF costs being met, absorbed or rejected	Costs now being met through HLS, previously through SSSI management agreement, but requiring adoption of new traditional beef herd separate from main business	Costs partly met by ESA, and fit with current needs of neighbours wanting low-input grazing land	Costs now being met through HLS, allowing major capital spend on scrub clearance. Rented grazing continuing as before	Costs currently absorbed, but are minimal as HNVF is a small proportion of larger rented grazing area	Mostly currently being rejected, despite interest amongst some small holders	Rejected, by fencing out the HNVF and continuing to maintain drainage on persistently reverting areas	Absorbed, as currently HNVF does not hamper the low level of grazing required of the land	Costs being met, now by HLS and previously by SSSI management agreement, and fits with wider beef regime on farm
Is the HNVF an asset, burden or irrelevance to the farm business?	HLS makes it a net asset for the next few years, but dependency on HLS will remain high unless subsidiary traditional beef herd proves itself for business	HNVF is regarded as an asset, because of personal interest and decision to live simply and not to maximise farm income – hence it is in reality a burden	HLS makes it an asset, which fits with owner's desire to maintain wildlife value. Would not be seen as warranting substantial financial outlay without HLS however	Largely an irrelevance at present, as has minimal impact on profitability and core business does not depend on grazing quality	Variable, but generally either a burden or an irrelevance, due to absence of management or lack of knowledge on how to enhance its usefulness	Previously regarded as a burden or a liability, hence fenced off and now an irrelevance	Regarded as irrelevant but actually a burden, as grazing quality is low but no agri-env income available to offset	Now an asset through HLS, and viewed as accepted part of farm because of farmer's traditional low-intensity approach
Trends in to HNVF	HLS offers prospect of a decade of consistent, focused input if it is successful, but future beyond that remains unclear, though the site is SSSI	Safe for the remaining tenure of the current owners	HLS will improve condition, and lack of reliance on the land for income should make it secure for medium term	While grazing is only required as tick-over to keep land in good condition, HNVF is probably safe. Owner considering HLS	Uncertain – multiple ownership means future depends on several independent decisions, and access to good advice	Little chance of small HNVF areas being brought back into management, as too small to qualify for HLS	While the land is used as low-value rented grazing there is little pressure to improve it, but also little desire to enhance its wildlife value	SSSI, HLS and farmer's approach means it is safe for period of current tenancy. Proximity to Neroche Forest grazing should help ensure future pos. mgt.

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Vulnerability of HNVF resulting from above	Fairly secure for short term (10 years)	Secure for remainder of current (elderly) owner's time there	Fairly secure for short term (10 years)	Vulnerable to change in grazing tenant's approach, or ownership	Vulnerable to several individual's preferences and abilities	Declining, but owner could be open to advice	Vulnerable to change in grazing tenant or ownership	Fairly secure for short term (10 years)
HNVF landscape features – hedges and other linear features, ponds etc								
HNVF costs being met, absorbed or rejected	Absorbed, but minimal	Partly met but subsidised by owner	Largely absorbed outside of HLS area	Absorbed, as consequence of pasture maintenance and game operations	Rejected at present, or absorbed in small cases	Met in part by ELS	Absorbed or rejected	Met in part by HLS, otherwise absorbed
Trends in to HNVF	Traditional approach to mechanical cutting will continue	Benign approach will continue while current owners are there	Woodland management is central to the farm. Hedges managed mechanically	Much dependent on how game business develops and performs	Static for now, unless a collective approach can be agreed through external advice	Traditional approach to mechanical cutting will continue	Static for now	Fairly benign approach secure for period of this tenancy
Is the HNVF an asset, burden or irrelevance to the farm business?	Minimal and hence part of normal farm maintenance	Enjoyed as an asset but really a burden, as costs (eg of using BTCV) outstrip income	Woodland is an asset, linear features seen as part of normal farm maintenance	In part an asset, where managed as part of game cover	An irrelevance for non-farming owners, while management remains minimal	Minimal and hence part of normal farm maintenance	Minimal and hence part of normal farm maintenance	Regarded as normal part of farm maintenance
Trends in approach to HNVF	Static	Static	Improving	Largely static	Declining	Static	Static	Static
Vulnerability of HNVF resulting from above	Limited but safe	Safe for period of current ownership	Positive and safe	Vulnerable to change in game business	Vulnerable due to lack of concerted input at present	Limited but safe	Vulnerable to change in grazing tenancy	Safe for current tenancy

Table A5: Socio-economic Context for HNV Management – Relevance, Trends and Vulnerability – on Sample Farms

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Appendix 2: Notes

NOTE 1: METHODOLOGY FOR DERIVING THE DRAFT MAP OF HNVF EXTENT IN THE FOUR CASE STUDY AREAS

The following data were used to produce the map:

- OS Mastermap (used as the base map from which HNVF land parcels were copied)
- Sites of Special Scientific Interest
- County Wildlife Sites
- Semi-natural vegetation
- Topography/slope
- Field size
- Landscape character
- Aerial photographs

The HNVF layer consists of copied OS Mastermap polygons. These polygons are taken from the Topo_Boundary layer. To facilitate selection and copying of the polygons the OS Mastermap layer was simplified to white polygon outline so that aerial photography could be seen beneath them.

The process for identifying HNVF was as follows:

1. The first stage was to digitise those OS Mastermap polygons which are co-located with SSSI and CWS.
2. The next stage was to work systematically across the AONB, using up to date aerial photographs, and digitise every instance of what appeared to be, from the aerial photographs, semi-natural vegetation (scrub, rough grazing, ponds etc.).
3. Another set of criteria for selection into the HNVF layer were agglomerations of small fields (high density of hedgerows), areas of orchard, small farm woodlands (broadleaved or mixed only – pure conifer plantation was excluded) and in some cases larger arable or grassland fields.
4. Finally, woodlands were brought in as High Nature Value Forestry is an aspect of the HNVF project.

Critique of effectiveness of aerial photograph analysis

Aerial photograph analysis varies in its ability to identify these categories of HNVF occurrence. HNVF on steep slopes around the springline is generally tussocky mire or rush pasture, and is easily identified remotely. Similarly, plateau heath stands out clearly. Lowland meadows (neutral grassland) tends to occur in fields which have been partially improved in the past, and have a more even, smooth texture from the air, which can easily be overlooked. Riparian wetland is usually rough in texture and can be identified.

Hence aerial photograph analysis can (provided it is carried out by a trained individual) identify a large proportion of HNVF in this type of landscape, but difficulties include the following:

- Good quality semi/unimproved neutral grassland, where not identified as SSSI or CWS, are almost impossible to identify from aerial photography. Rough/scrubby grassland is quite obvious. Some semi-improved rush pasture may also be overlooked.

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- Arable land is problematic. CWS/SSSI do not generally represent good quality arable (i.e. rare plant/bird interest), though some CWS are designated for bird interest (South Devon Cirl Bunting CWSs). Stubbles or other cropland could also be mis-identified as being heath/tussock, given their similar rough texture
- Field patterns are not necessarily an indicator of high nature value.

NOTE 2: DATA SOURCES FOR FARMING CHARACTERISTICS AND TRENDS

Farming characteristics and trends in the case study area can be analysed through the following data sources:

- Farm Survey data (from the latest Defra June Survey). This data is available for the AONB and the sample parishes. For the sample parishes, some limited data for holdings with HNVF has also been obtained from Natural England. More detailed data on the farming characteristics of holdings with HNVF is unfortunately not available.
- Rural Land Register data (from the Rural Payments Agency). For the sample parishes, some limited RLR data for holdings with HNVF has been obtained from Natural England. More detailed data (e.g. RLR holding size, field size etc) is unfortunately not available.
- Single Payment Scheme data (from the Rural Payments Agency). This has the potential to show, by individual holding, land use, stock type present and other data. Unfortunately, this data was unavailable to review and analyse.

NOTE 3: DATA SOURCES FOR FARM BUSINESS INCOME

Farm Business Income (FBI) data is collated for Defra by Duchy College in the SW region. It provides robust financial data for a sample of farms in the SW region however it is not possible to extract a sub-sample for farms in the AONB, let alone farms with HNVF in the AONB.

The Farm Business Income section also draws on reports produced by the Centre for Rural Policy Research for Devon County Council. These include 'Farm Incomes in Devon 2007/8' (Lobley et al, 2009), which has been updated to include the latest available FBS data for South West England (2008/9). FBI is Defra's preferred measure of farm income and represents the return to all unpaid labour (farmers, spouses and others with an entrepreneurial interest in the farm business) and to all their capital invested in the farm business including land and farm buildings. This is essentially the same as net profit. Note only farms capable of supporting at least 0.5 labour unit are included in the FBS (for lowland grazing livestock farms, this equates to 30 suckler cows and progeny, equivalent to a 75 acre farm at an average stocking density).

NOTE 4: NATURAL ENGLAND HOLDING ASSESSMENT TOOLKIT SCORING

Natural England uses the Holding Assessment Toolkit (HAT) to score individual holdings in terms of the presence of particular features, designations or other characteristics in order to prioritise holdings for HLS funding. The criteria include:

- Target areas and theme areas
- Access, including

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- Public rights of way
- CROW (Countryside and Rights of Way Act 2000) designated land
- Biodiversity, including
 - SSSI and other designations
 - BAP habitats
 - Rare species
- Historic Environment, including
 - Scheduled Monuments
 - Undesignated sites/features
- Landscape, including
 - AONB
- Resource Protection, including
 - Catchment Sensitive Farming area
 - Flood risk

There are five categories of HAT score: A (highest), B, C, D and E (lowest).

Not all holdings have been HAT scored.

NOTE 5: HNV FARM TYPOLOGY

A number of studies have attempted to identify farming systems associated with HNV farmland. These include Anderson et al (2003) and IEEP (2007) which both set out HNV farming systems typologies. Simplified versions of the more recent IEEP typology is set out below, showing those HNV farming systems potentially relevant to the Devon case studies.

Broad Category	HNV Farming System
Potential HNV cattle systems (beef and dairy)	Extensive systems using semi-natural pastures
	Extensive grass based systems
	Extensive grass/arable systems
Potential HNV sheep and goat systems	Sedentary low-intensity systems on semi-natural grassland
Potential HNV arable crop systems	Semi-intensive arable systems
Potential HNV permanent crop systems	Traditional orchards

Source: adapted from IEEP (2007)

Table A6: HNV Farm Typology - IEEP

When scoping potential farms to be surveyed, a number of categories were identified by the project team as representing the range of farms in the Blackdown Hills likely to have HNV farmland – essentially a local HNV farm typology. This typology was based on an analysis of Defra farm survey data for the AONB and sample parishes, and a review by the project team of farming systems known and likely to support HNV farmland. The typology provides a number of sub-categories reflecting the extent of HNV land and the nature of the ownership. The local typology is shown in Table A7 alongside the relevant IEEP categories and Defra farm types (using our best estimates).

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HNV farm type (Blackdown Hills)	HNV farm type (IEEP)	Defra farm type
Lowland grazing livestock farm (beef/sheep) – small amount of HNV	Extensive grass based systems	Grazing livestock (lowland)
Lowland grazing livestock farm (beef/sheep) - high amount of HNV	Extensive grass based systems	Grazing livestock (lowland)
Dairy farm – small amount of HNV	Extensive grass based systems	Dairy
Dairy farm – medium/high amount of HNV	Extensive grass based systems	Dairy
Mixed farm - grazing but also includes some arable	Extensive grass/arable systems	Mixed farm
Non-farming landowner – small amount of HNV	Extensive grass based systems	Other
Non-farming landowner – high amount of HNV	Extensive grass based systems	Other
Larger estate	Extensive grass based systems or extensive grass/ arable systems	Other/Mixed

Table A7: HNV Farm Typology – Local

Sample Parishes

A series of four sample parishes in the Blackdown Hills AONB were identified at the outset of the case study in order to provide a manageable area as the basis for analysing detailed RPA/NE data including RLR and SPS data. These parishes were also used to identify suitable farms for survey using the local typology referred to above. The sample parishes – Churchstanton, Clayhidon, Hemyock and Luppitt - are broadly characteristic of the AONB as a whole.

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