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High Nature Value farming throughout EU-27 and its financial support under the CAP

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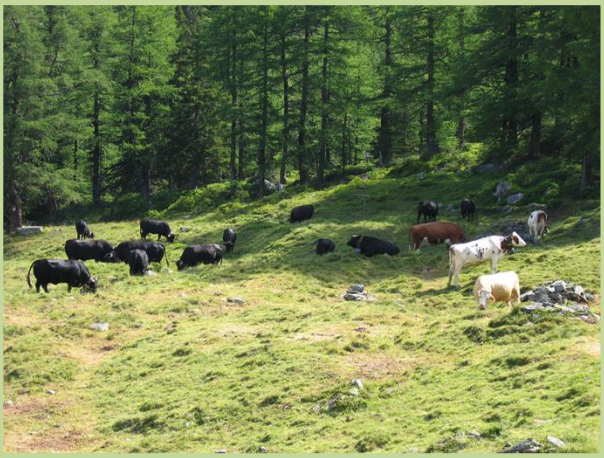

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Glossary

AE	Agri-environment
ANC	Area of Natural Constraint
AWU	Annual Work Unit
BPS	Basic Payment Scheme
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CMEF	Common Monitoring and Evaluation Framework
CORINE	Coordination of information on the environment
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EEA	European Environment Agency
EENRD	European Evaluation Network for Rural Development
EFA	Ecological Focus Area
EIA	Environmental Impact Assessment
ESA	Environmentally Sensitive Area
EU	European Union
EU-12	Member States which joined after 2004 (except Croatia)
EU-15	Member States which joined prior to 2004
EU-27	All Member States before Croatia's accession
EU-28	All Member States including Croatia
FADN	Farm Accountancy Data Network
FCS	Favourable conservation status
FAS	Farm Advisory System
FSS	Farm Structure Survey
GAEC	Good Agriculture and Environmental Condition
GIS	Geographic Information System
GP	Greening Payment
GPP	*Gabinete Planeamento e Políticas* (Portugal)
HNV	High Nature Value
HNVF	High Nature Value farmland and farming system (as a combined concept)
IACS	Integrated Administration and Control System
IBA	Important Bird Area
IPA	Important Protected Area
IRENA	Indicator Reporting on the Integration of Environmental Concerns into Agricultural Policy
ITI	Integrated Territorial Intervention (approach to implementing RDP measures in Portugal)
JRC	Joint Research Centre
LEADER	Links between the rural economy and development actions
LFA	Less Favoured Area
LIFE+	The EU's funding instrument for the environment
LMO	Land Managers' Options (approach to implementing RDP measures in Scotland)
LPIS	Land Parcel Identification System
LU/ha	Livestock unit per hectare
LUCAS	Land Use/Cover Area frame statistical Survey is a European field survey programme
MARM	Spanish study - statistical analysis to map nature values
MS	Member State
MTE	Mid-Term Evaluation of the 2007-13 RDPs
N2000	Natura 2000
NGO	Non-governmental organisation
NUTS	Nomenclature of Territorial Units for Statistics
P1	Pillar 1
P2	Pillar 2
PBA	Prime Butterfly Area
PPP	Plant Protection Products
RD	Rural Development

RDP	Rural Development Programme
RP	Rural Priorities (approach to implementing RDP measures in Scotland)
SAPS	Single Area Payment Scheme
SER	Society for Ecological Restoration
SFS	Small Farmers Scheme
SLSI	State Land Survey Institute (Lithuania)
SMR	Statutory Management Requirement
SPS	Single Payment Scheme
TEEB	The Economics of Ecosystems and Biodiversity
UAA	Utilised Agricultural Area
UFC	Unfavourable Conservation Status
WFD	Water Framework Directive
WWF	World Wide Fund for Nature

Executive Summary

High Nature Value (HNV) farming is a relatively new concept that describes the farming systems in Europe of greatest biodiversity value. The environmental importance of HNV farming has been recognised for some time, but there has been very little research done on the agricultural and economic aspects of HNV farming or on the support provided by the Common Agricultural Policy, which is the main source of public funding for environmental management of farmland in the EU.

Economic pressures have caused and continue to threaten the abandonment or intensification of large areas of HNV farmland, with irreversible loss of the associated habitats and species of European importance for biodiversity. HNV farming is essential if the EU is to meet its 2020 biodiversity targets, but the policy context of recent years seems to be failing to halt the decline of HNV farming, with notable exceptions in certain cases.

This study is intended to contribute to the evidence base to inform the design of future EU policy for HNV farming.

Characteristics of HNV farming in the EU

HNV farming is characterised by long-established, low-intensity and often complex farming systems using labour intensive practices, livestock breeds and crop types highly adapted to local soils, vegetation and climate. HNV farms vary in size, structure and land tenure, often using common pastures.

HNV farming has created and maintains habitats that are amongst the most important for biodiversity in Europe. These include a wide range of semi-natural habitats (typically with high species diversity and unique species communities), as well as habitats that are less natural but nevertheless are the main refuge for a significant number of farmland species. Many of these habitats and species are scarce and/or declining and, as a result, are the focus of conservation measures under the EU Birds and Habitats Directives.

HNV livestock and mixed farming systems occur throughout the EU, providing the grazing livestock that maintain a wide variety of important habitats, including traditional wooded pastures found on a large scale in parts of the Mediterranean and the south-east, and on a smaller scale in other regions. HNV permanent crop and arable farming systems occur predominantly in southern Member States.

Landscapes where most of the farms are managed under a low-intensity HNV farming system are the most valuable for biodiversity, but no longer exist in some Member States. Where these do survive they are often economically vulnerable and at high risk of abandonment or damaging structural change. Elsewhere, HNV farmland habitats such as semi-natural pastures are still a functional part of farm businesses that depend on other more intensively managed land. On fully intensive farms, surviving remnants of HNV land, often with no functional role in the farm business, can be valuable for biodiversity. Although the biodiversity of these remnant HNV patches may be constrained by their small size and isolation, they are important within the wider agricultural landscape as stepping-stones, helping to maintain connectivity amongst other patches of habitat.

The extent and distribution of HNV farmland in the EU

Earlier estimates suggested that the total extent of HNV farmland might be as much as 30 per cent of agricultural land at EU-27 level, but the land cover data on which these were based has well recognised limitations. Since 2008 the main focus on identifying HNV farmland at both EU and Member State level has been on land cover (driven by the monitoring requirements for RDPs), although data on farming characteristics and biodiversity have also been used several cases. Within individual Member States there can be several different estimates of the extent of HNV farmland, depending on the data sets and criteria used. This study identifies the best available estimates of HNV farmland extent in each of the EU-28 Member States.

The two main uses for HNV farming data are to target policy instruments, in particular CAP funding; and to monitor changes in HNV farmland in order to assess the impact of policies and to provide evidence for future policy. To a certain extent these uses require different types of data.

There are three ways of looking at HNVF, through land cover, biodiversity and farming characteristics, and understanding all three at farm and parcel scale is important for effective policy intervention. Land cover data such as CORINE are constrained in their ability to distinguish between different types of farmland habitat, and can only indicate likelihood of HNVF land cover, not agricultural activity. Although very few Member States have comprehensive semi-natural habitat information at the scale required, many have partial data that could be completed. Species data is inconsistent, but bird data have been useful in defining HNV farmland supporting populations of important species. In agricultural data sets such as FSS and LUCAS the level of detail on HNV farming characteristics and practices provides only a general indication of possible HNVF, but with relatively small changes this data could be more useful. EU-wide, annually updated IACS/LPIS records offer the best possibility if in future these were enriched by data relevant to HNV farming.

EU legislative protection for HNV farmland

Before considering the effect of CAP funding on HNVF, the study identified what EU legislative protection is provided for HNV farmland, under both environmental and agricultural policies. This legislation is significant both in itself and because it is part of the environmental requirements that underpin CAP land management payments.

Under the Birds and Habitats Directives, Member States are required to take action to conserve threatened habitats and species in Europe, of which 57 types of habitat and 257 species depend on or are associated with farming activities, typically those on HNV farms. Despite this requirement more than more than 75 per cent of these habitats and at least 70 per cent of the species are in unfavourable conservation status.

Within most Natura 2000 areas, legally binding requirements and site management plans have only limited influence on farm management and the consequent effects on biodiversity. Some threatened habitats (and a large proportion of other HNVF land) lie outside Natura 2000 sites, where farmers' obligations to protect habitats and species of European importance are often poorly defined and EU legislation is weakly enforced. Thus, both within and outside Natura 2000 areas, pro-active conservation of these important

farmland habitats relies largely on the voluntary action of farmers and the provision of funding and guidance through agri-environment or similar schemes.

CAP area-based farmland payments are conditional upon compliance with defined standards, including those for Good Agricultural and Environmental Condition (GAEC). The way in which Member States defined GAEC standards in 2007-13 has had a mixed impact on HNVF. Some Member States defined standards for minimum stocking densities that have helped to prevent under-utilisation, but many others required only the mechanical clearance of vegetation, thus risking a breakdown of the HNV farming system, deterioration of semi-natural habitats and loss of diversity in mosaic HNVF landscapes. Protection of terraces was potentially beneficial but often too costly for famers. Requirements for removal of 'unwanted' vegetation were helpful where applied sensitively, for example to remove invasive alien species or control excessive scrub invasion, but damaging when they required complete removal of non-herbaceous elements in HNVF habitats.

For 2015-20, the cross-compliance framework has been simplified. The effects on HNV farming will depend firstly on how Member States define standards for landscape features under the new GAEC framework; and secondly on how Member States choose to use the considerable flexibility available in the legislation when they define minimum agricultural activity on land eligible for CAP direct payments. The Commission's reluctance to allow this definition to include requirements for minimum livestock densities is a particular concern.

Influence of CAP payments on HNV farm incomes

The inherently low productivity of HNV farmland and the typically labour-intensive farming practices on which the biodiversity depends put HNV farms at a disadvantage in competitive markets. This means that they are often very dependent on CAP support to maintain farm incomes. Current reporting of CAP direct payments and RDP expenditure at farm level does not distinguish between HNVF and other farmland, which makes it impossible to identify at EU or Member State level what proportion of the total CAP direct payments, agri-environment and LFA compensation payments are going to HNV farms.

The case studies reveal that HNV farm incomes generally are lower than on other farms, and that CAP support is generally much lower than on other farms, particularly in regions where the historic SPS system is applied. In Italy a typical HNV farm manages twice as much land as a non-HNV farm but achieves only a quarter of the value added per hectare. Hill livestock farms in the United Kingdom rely on SPS and LFA payments to offset losses from their low-intensity HNV systems. For the farmers in remote, wet areas of North West Scotland who maintain important HNVF habitats by grazing suckler cows, the total of all their CAP payments (which are much lower on a per hectare basis than those in more productive regions of the country) is not even sufficient to offset the losses of HNV livestock farming.

Despite the evident significance of CAP support to HNV farm incomes, it is clear from this study that some HNV land of critical importance for biodiversity was partially or completely excluded from CAP support in 2007-13. In some Member States with large areas of land under HNV farming systems a significant proportion of HNV land and farmers do not receive CAP support payments. This includes land with threatened habitats dependent on agricultural management that are the focus of conservation measures under the Habitats

Directive and which Member States have a duty to maintain in, or restore to, 'favourable conservation status'.

There are several reasons for these failures to provide CAP support, including HNV farmed land defined as 'non-agricultural' or 'ineligible'; insufficient allocation of SPS rights in relation to the area of land actually used by farmers; the presence of 'too many' trees and rocks in semi-natural pastures; and the small size of some HNV farms and parcels.

The CAP reform legislation offers Member States opportunities to revise their CAP eligibility criteria for semi-natural pastures, trees and landscape features, minimum farm and parcel sizes, and to allocate payment entitlements in a way that gives HNVF land and farmers much better access to CAP income support payments. It is unclear if and how Member States will choose to use these options, which could have consequential impacts on payments to other farmers and the workload of paying agencies. In some Member States there is an unwillingness to include within the new direct payments system land that was not receiving payments under the pre-2014 CAP, even if such land has been in farming use for many years.

Use of RDP and similar payments to support HNV farming

Many Member States have specifically designed and targeted agri-environment schemes for the management HNVF semi-natural habitats, species and native breeds of livestock, but in some cases eligibility criteria and/or funding have limited the capacity of these schemes to reach all the HNV farmland that could benefit. Less focused agri-environment schemes may also benefit HNVF to some extent. In some Member States the coverage of HNV farming by beneficial agri-environment schemes is considerable while in others it is extremely limited, including some with a major HNVF resource, for example Spain. A few Member States make significant use of state aid to fill gaps in coverage of agri-environment payments and for habitat restoration.

The RDP measure that allows Member States to compensate farmers for legally binding restrictions in Natura 2000 area was used in some Member States, but by 2009 only five of those had achieved their planned targets, largely due to delays in setting legally defined requirements. More use could have been made of RDP non-productive investment support for restoration of HNVF habitats and landscape features.

LFA payments account for a significant share of many RDP budgets. These payments can contribute to HNV farm incomes but the levels of support and the coverage of farmers within the LFA varies greatly from one Member State to another. LFA payments are classed as one of environmental land management measures in Pillar 2 and can therefore require specific land management, but as currently implemented these payments rarely require or support HNV farming systems and practices, other than sometimes setting minimum grazing levels.

Few examples were found of other RDP measures used specifically to support HNV farming. It is unclear to what extent measures to support competitiveness of farming are available to and used by HNV farmers, or if there are safeguards to protect HNVF from damaging intensification.

Member States' experience of developing the CMEF HNV farming indicators

As part of the monitoring and evaluation of the 2007-13 RDPs Member States are required to define an HNVF baseline indicator of 'utilised agricultural area of HNV farmland' and to report on RDP expenditure on HNVF land management and changes in HNV farmland. This has proved to be the most problematic CMEF indicator to implement. Defining the baseline HNVF indicator generated a great deal of work across the EU, most of it still incomplete. The HNVF result and impact indicator have not yet been used except in a very few cases.

Insufficient data on HNVF land cover, intensity of management and biodiversity, and a lack of regularly updated datasets required to monitor change have frustrated the attempts of those Member States who sought a comprehensive definition. Others initially defined a limited baseline indicator (area of Natura 2000 farmland in some cases) or focused just on semi-natural habitats or on data useful for targeting agri-environment payments.

Efforts to overcome the problems of finding adequate data sets to meet Commission guidelines on the baseline indicator have led some Member States to devise alternative approaches to monitoring HNVF. These include a new sample survey of HNV farmland in Germany, enhanced IACS/LPIS data in Portugal and Finland, a combined 'basket' of existing regional datasets and sample surveys of HNVF systems in Navarra (Spain) and a GIS-based approach in Estonia combining of fifteen different indicators at a scale of 1 x 1 km.

Estimating EU funding needed for HNV farming - a farm payments approach

The need for more effective CAP support for HNVF is clear, but estimating the scale additional funding needs is problematic, given the scarcity of CAP monitoring data on current expenditure relevant to HNVF at EU-level. Instead, a more focused approach was taken for this study, examining available data on CAP expenditure from three Member States which have large areas of HNVF but very different farming and policy contexts, identifying gaps in current HNVF support and exploring how these might be filled.

In Aragón (Spain) there are between 2 million and 3 million hectares of HNVF land but estimates are problematic because of inconsistent databases and inadequate recording of farming activity in the case of rough grazing land. LFA payments are too small and thinly spread to support HNVF, and agri-environment schemes do not reach the vast majority of HNVF land (not even the majority of Natura 2000 grasslands and arable land). A five-fold increase in current LFA, agri-environment and Article 68 expenditure would be needed just to extend coverage of these schemes to all Natura 2000 farmland in the region. Alternatively, rebalancing current CAP support from both Pillars to offer a widely available package of HNVF specific support measures could reach more HNVF land with no increase in total CAP expenditure in the region (and reduced need for co-financing). Although there is limited scope for linking decoupled Pillar 1 payments to specific HNVF systems (other than through special measures such as Article 68) raising the level of direct payments for this HNV farmland would provide the income support element needed to accompany Pillar 2 payments targeted more specifically at HNVF land management.

In Scotland around three million hectares of semi-natural pastures are managed by low-intensity HNV livestock farming, but total SPS and LFA payments for this area fall short of offsetting farm business losses by €63 million a year. More damagingly, the current support

structure provides a financial incentive for farmers to cut losses by reducing the scale of the most valuable HNVF systems. A more coherent package of CAP payments focused on HNVF land could be more effective for both farmers and biodiversity conservation, with only a modest increase in funding.

In Romania the current picture is more positive. Here HNVF is characterised by a very large number of small farms, and an ambitious agri-environment programme for HNV farming systems reaches more than one million hectares of HNV grassland, making up the largest share of the total CAP support at farm level. Flat rate SAPS and LFA payments create no disparity in CAP income support between HNVF and more intensively farmed land, in contrast to current SPS payments in Scotland and Spain.

Estimating EU funding needed for HNV farming – a habitat management approach

The study used a second approach to estimating funding needs, looking at the scale of the additional funding required at EU-27 level to maintain and restore HNVF semi-natural habitats by 2020, in the face of expected pressures. This was based on the estimated extent of HNVF land, the reported conservation status of HNV farmland habitats and the payment rates for agri-environment and similar measures. The estimates cover HNVF natural and semi-natural grasslands and their associated landscape features, grazed heaths, moorland and tundra, grazed *maquis*, *phrygana* and other Mediterranean scrub (but not the large areas of wooded pastures in the Iberian peninsula, because conservation data were not available).

The additional cost is estimated to be between €130 and €1,100 million per annum to maintain existing HNVF habitats and restore 15 per cent of degraded areas, rising to between €730 million and €3,300 million if 100 per cent of the degraded habitats are restored by 2020. The large range is explained by the lack of precise data on the extent and level of degradation of HNVF habitats. The estimates are based on current unit costs of habitat restoration but some areas would be much more costly to restore, to meet the 100 per cent target.

Meeting the challenge of supporting HNVF

Active management of HNV farmland is critical to meet biodiversity targets but HNV farming is part of the overall agricultural sector and is widely distributed within rural areas, not just within protected areas. Therefore it is more readily supported through an agricultural incentive model of policy than a protected area/development control approach. This will require considerable adaptation and fine tuning of the current agricultural model, and now is a good time to embark on this given the decline in HNVF management (not just abandonment) and the declared aim of 'greening the CAP'.

The challenge facing Member States in 2014 is how best to use the reformed CAP support in a way that improves the economic viability of HNV farms without compromising their characteristic biodiversity value and locally adapted low-intensity farming systems. The study concludes with specific suggestions on how this could be done at Member State and regional level within the scope of the new CAP legislation.

HNV farmers must have access to CAP support from both Pillars of the CAP, but HNV farms are more sensitive to eligibility rules than other farms precisely because of their inherent character. Ensuring HNVF eligibility, particularly for direct payments, may require changing Member States' eligibility criteria for minimum farm or parcel size; widening their definition of agricultural land to cover traditional wooded pastures, fens, heathland and all other Annex 1 agricultural habitats and common pastures; recording all HNVF land and landscape features in LPIS/IACS (or using sensitively designed pro-rata calculations of eligibility); and allowing all farmland in active use to claim the new Pillar 1 payments, not just the farmland with SPS/SAPS rights under the old system.

Effective packages of CAP support for HNV farming require two components which work effectively when they come together 'at the farm gate'. Firstly, to ensure the survival of those farms still using whole or partial HNV farming systems will require a combination of direct payments linked to a minimum farming activity, environmentally coupled income payments and capacity building support specifically designed to counter the economic pressures to abandon or intensify characteristic low-intensity grazing and cropping or change the use of HNV farmland by afforesting it. Secondly, support will be needed for more widespread habitat and species management to maintain existing HNVF habitat, and habitat restoration work to restore degraded areas, thereby contributing to the EU and CBD target of restoring 15 per cent of degraded ecosystems.

Providing and targeting cost-effective HNVF support under the CAP requires better data on HNVF land and farms. EU agricultural data sets such as FSS, FADN and IACS/LPIS could be extended and improved to identify and record HNVF variables in a way that would make these data sets more useful in targeting, monitoring and evaluating the impact of CAP support for HNVF. At Member State or regional level, existing partial environmental data systems on land cover, biodiversity, semi-natural habitats and species could be completed, regularly up-dated and linked to improved agricultural data sets.

Conclusions

This study has shown HNV farming is sufficiently important in terms of biodiversity and other societal benefits to be worth quite a lot of trouble to achieve the changes needed. Although some of these may be hard to characterise precisely it is worth further concerted effort now to seize the opportunities offered by the current CAP reform. HNV farming does not stand still, and in common with other farming sectors it must accommodate not just economic pressures but also generational change, new ways and some adaptation. The report suggests a range of practical measures to improve support for HNV farming, some of which could be implemented immediately, others of which are longer term.

There are possible solutions, and a great deal of work in progress, as the case studies have shown. We have to build on the success already achieved in some parts of the EU. Member States must be encouraged to press on with workable approaches for supporting their particular HNV farming systems, with the help and guidance of the Commission. The new CAP widens the opportunities for HNVF support but the key decisions have to be taken quickly within a timescale set by the legislation. The publication of guidelines for Member States on how best to use the new CAP to support HNVF might increase their confidence in making changes and also minimise problems of interpretation of the new legislation.

1 Introduction

Key findings

- **This study is intended to contribute to the evidence base for future HNVF policy in the EU.**
- **HNV farming is a relatively new concept that describes the farming systems in Europe of greatest biodiversity value, but little research has been done on the agricultural and economic aspects of HNV farming or on the support provided by the CAP.**
- **Economic pressures have caused and continue to threaten abandonment or intensification of large areas of HNV farmland, with irreversible loss of the associated habitats and species of European importance.**
- **The policy context of recent years seems to be failing to halt the decline of HNV farming, with notable exceptions in certain cases.**
- **HNV farming is essential if the EU is to meet its 2020 biodiversity targets.**

1.1 Scope and purpose of this study

Although the environmental importance of HNV farming has been recognised for some time and aspects of its significance for biodiversity have been the subject of research, there has been very little research done on the economic aspects of High Nature Value (HNV) farming in order to ascertain the level and type of financial support that is required for its continuation. Furthermore, existing agricultural data sets (many of them long-established) are focussed mainly on the more productive and intensive farming systems and on larger farms, and the statistics make no distinction between different intensities of land use. This means that even where HNV farms are included in data sets it is very difficult or impossible to extract data specifically about HNV farming systems. Earlier estimates suggested that the total extent of HNV farmland in the EU-27 might be as much as 30 per cent of agricultural land, with a range at Member State level from 10 per cent the north to 50 per cent in some southern Member States (Hart *et al*, 2012) but those estimates are based largely on CORINE data that can only indicate likelihood of HNV land cover, not agricultural activity. Work done at Member States level to provide more precise estimates of the extent of HNV farmland is discussed in Chapter 3.

The overarching objective of the study is to draw together and consolidate information about HNV farming in the EU, in a way that will help evaluate the need for new policy instruments and associated funding to ensure the continuity of HNV farming and the maintenance of biodiversity and other environmental benefits it provides. The study is intended to provide part of the evidence base to inform the design of future EU policy for HNV farming.

The remarkable lack of published data on HNV farming both at EU level and in almost all Member States both underlined the need for this study and determined the way it was conducted. The information that is available exists in a wide range of forms within individual Member States or regions, often in separate agricultural and environmental data sets and

unpublished reports. The recently published book *High Nature Value Farming in Europe* was a significant step forwards, drawing together and illustrating experiences and perspectives of HNV farming in 35 European countries (Oppermann *et al*, 2012), and has proved to be a valuable source of information for this study.

Most of the information presented here has been compiled by 20 individual HNV experts across the EU, familiar with the situation in their own Member States. For the remaining Member States information was sought from the agriculture departments and published data. A wide variety of national and regional data sources have been used, both published and unpublished, and expert opinion has been sought where data do not exist. The study covers 25 Member States. Luxembourg and Malta are not covered due to lack of data, but together are estimated to have less than 0.2 per cent of the total HNV farmland in the EU[1].

This report describes the characteristics of HNV farms, farmland, farming systems and practices and assess the available data on the extent of HNVF land in each Member State (Chapters 2 and 3); provides an overview of legislative protection of HNVF under EU Regulations (Chapter 4); discusses the significance of CAP Pillar 1 support and the economics of an HNV livestock system (Chapter 5); considers how Member States have used rural development payments and similar publicly funded support for HNVF (Chapter 6); describes Member States' experience of developing the CMEF HNV farming indicators (Chapter 7); considers future funding needs for three examples in Spain, Romania and the United Kingdom (Chapter 8); and attempts to estimate the overall additional CAP funding needed to maintain and restore the ecological value of Type 1 HNV farmland (Chapter 9); summarises for individual Member States key facts about HNVF and identifies policy priorities for the future (Chapter 10); discusses the policy, data and administrative challenges of ensuring a secure future for existing HNV farming across the EU (Chapter 11); and presents the main conclusions of the study in Chapter 12.

1.2 Concept of High Nature Value farmland and farming systems

Until comparatively recent historical times *all* agriculture and forest management in Europe was High Nature Value (HNV) and all farming systems were HNV (Oppermann *et al* 2012). This changed quite rapidly during the 20th century with the advent of readily available external sources of power and mineral fertilisers, followed by technological developments that made it possible to remove barriers to exploiting productive capacity. This led directly to the irreversible loss of vast areas of High Nature Value farmland and farming systems (HNVF) across Europe through the intensification of almost all of the more productive cropped land and large areas of pastoral land. The remaining HNV farming systems and farmland continue to be subject to economic and other pressures, putting them at varying degrees of risk of intensification, structural modification or abandonment with associated risks of losing the environmental benefits they provide.

The term 'High Nature Value Farming' was first used in the early 1990s to describe the concept that the conservation of biodiversity in Europe depends on the continuation of low intensity farming systems across large areas of countryside (Baldock *et al,* 1993; Beaufoy *et*

[1] Croatia has significant area of HNVF but was not included within the scope of this study because it was commissioned prior to Croatia's accession to the EU. Croatia has been covered where information was readily available.

al, 1994; Bignal and McCracken, 1996). These farming systems and the diversity of habitats and species they support have been interdependent for a very long time and most of the plant communities of semi-natural grasslands and the weed communities of arable land have developed their typical composition over hundreds and sometimes thousands of years in a co-evolution of agriculture and nature (Oppermann *et al,* 2012).

As described in Beaufoy and Cooper (2008), HNV farmland is typically characterised by a combination of low intensity land use, the presence of semi-natural vegetation and unfarmed features and a diversity of land cover and land uses. More recently Pienkowski (2011) noted that low intensity *farming systems* often have production cycles with relatively low inputs and are usually labour intensive and ecologically sustainable. Many semi-natural habitats that are maintained through HNV systems are now rare or declining in the EU and are therefore habitats of Community interest[2] and subject to conservation measures under the Habitats Directive within the Natura 2000 network of protected areas and elsewhere. There are 57 different habitats of Community interest that depend on farming and may therefore be assumed to be HNV habitats. Member State data[3] on the distribution of these 57 habitats in EU-25 show that 30 habitats have 60 per cent or more of their area within the Natura 2000 network and a further 19 habitats have at least 30 per cent of their area within the Natura 2000 network (Olmeda et al, 2014). Many Natura 2000 sites will also include other types of HNV farmland important for species of Community interest listed in the both the Habitats and Birds Directive. The large-scale presence of HNV farmland habitats and species of high biodiversity importance within the Natura 2000 network should make this HNV land a particularly high priority for conservation management and habitat restoration.

Nevertheless, it is also clear that very large areas of semi-natural HNV habitats and other types of HNV farmland occur outside the Natura network and also need to be conserved to contribute to the objectives of the Habitats and Birds Directives (which apply to habitats and species of Community interest across their EU range, not just in Natura sites). Furthermore, it is important to maintain HNV farmland in the wider environment, both to help maintain ecological connectivity amongst Natura sites and also for its own biodiversity value. Maintaining the existing biodiversity value of this land requires the continuation of locally adapted low intensity farming systems and methods. Whether in the wider countryside or within protected areas, the loss of HNV farmland, through inappropriate farming systems and management practices or land use change, is likely to cause a major and often irreversible loss of their characteristic biodiversity benefits, habitats and species (Keenleyside and Tucker, 2010; Poláková et al, 2011). Consequently, safeguarding <u>all</u> existing HNV farmland is essential to meeting the EU's biodiversity target of halting and reversing the decline in EU biodiversity and ecosystem services.

HNV farmland is managed by all the main agricultural sectors and, although extensive livestock and mixed systems predominate, extensively managed arable and permanent crop systems are important too, particularly in southern and south-eastern Europe. These HNV farming systems tend to be found in the more marginal areas of the EU where agricultural productivity is constrained by factors such as poor soils, steep slopes, high altitude or low rainfall. HNV farming systems are often highly adapted to these biophysical constraints in

[2] As listed in Annex I of the Habitats Directive (Council Directive 92/43/EEC).
[3] 2008 data held by the European Topic Centre on Biodiversity, excluding Romania and Bulgaria.

ways that require comparatively high levels of labour input per unit of production. This means that both the HNV farm business as a whole and the return on labour are often uncompetitive compared to more intensive farms producing the same products or to alternative employment opportunities outside farming and are therefore very susceptible to market pressures. Those farmers who deliver the greatest biodiversity benefit are therefore typically farming under the most difficult circumstances (social, economic and environmental) and are subject to the greatest pressures to abandon their traditional way of farming (Keenleyside and Tucker, 2010). Such pressures on HNV farmland can lead to either abandonment or intensification (perhaps with amalgamation of HNV farm units) and the consequent loss of HNV farming systems and practices, as well as reduced diversity of farmland management. This can happen at a farm scale or on parcels of HNV land within larger farm units, but once HNV management has been lost it very difficult and expensive to reinstate and there may be a limited timescale in which it is possible to achieve this (eg before natural regeneration or artificial planting of forest overtakes HNV grassland habitats and leads to irreversible loss of the HNVF habitats and associated species).

1.3 HNV farming in the context of EU environmental and agricultural policy

In the context of EU policy, HNV farmland is of critical importance to achieving the EU 2020 Biodiversity Strategy Target 3 by 2020, to 'maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU2010 Baseline, thus contributing to enhance sustainable management'. HNVF also provides other key ecosystem services, such as the maintenance of good soil functionality (which helps to prevent significant water pollution), the provision of carbon storage and the management of cultural landscapes. HNV farming systems also make a significant contribution to sustaining rural communities and maintaining rural culture and traditions.

There has been an increasing discussion of the value of and risks to HNV farmland at EU level over the last 10 to 15 years but the real and practical issues relating to the maintenance of HNV farming systems remain relatively marginal and detached topics on the public agenda with discussion and debate limited to a few specialist (albeit highly motivated) interest groups. The HNV concept was not formally recognised within the Common Agricultural Policy (CAP) until 2006, although agri-environment measures have had the ability to support HNV farming practices since Member States were given the option of providing national aid in environmentally sensitive areas in 1985[4]. For the 2007-13 programming period, the 'preservation and development of high nature value farming systems' was formalised as one of three core priorities to be addressed under the land management measures of Pillar 2 of the CAP[5].

The maintenance of HNV farmland in the face of threats such as intensification, abandonment, afforestation and land use change is critical in contributing to halting the loss of farmland biodiversity in the EU. A much better understanding is needed of the scale

[4] Article 19 of Council Regulation (EEC) No 797/85 of 12 March 1985 on improving the efficiency of agricultural structures. Official Journal L 093 , 30/03/1985 P. 0001 - 0018

[5] Community Strategic Guidelines for Rural Development (Council Decision 2006/144/EC)

and nature of HNV farming and the possible means and costs of maintaining this environmental resource in the EU-27, to inform decisions about the allocation and targeting of financial resources in the next programming period.

1.4 Biodiversity value of HNV farming

The HNV farming concept is founded on the recognition that, at the lowest end of the farming intensity spectrum, the productive fields themselves (not just the farmland margins, the hedges, walls and ditches) support a range of wildlife species that are absent from intensively farmed land and, for some species, from any other remaining EU habitat (Oppermann *et al* 2012). This is especially the case for farmland that is semi-natural vegetation, dominated by native grasses, herbaceous plants, scrub or woodland that is grazed and/or cut on a regular basis, but not substantially modified by ploughing, sowing, intensive fertilisation, drainage or herbicide use. The resulting vegetation is of particular conservation value in Europe, and includes the 57 habitats of Community interest that are linked to HNV farming, of which 23 are considered to be fully dependent on appropriate agricultural practices (Halada *et al,* 2011). These fall into eight broad groups: coastal and halophytic habitats; coastal sand dunes and inland dunes; temperate and boreal heath and scrub; natural and semi-natural grasslands; bogs and fens; rocky habitats; and wooded pastures and meadows. Any classification of HNV farming systems is further complicated by the overlap of extensive agricultural and forestry systems found in the traditional wooded pastures and meadows of Northern Europe, the *dehesas* and *montados* of the Iberian peninsula and other forest grazing systems found especially in southern Member States. In some HNV systems the relationship between cropping, pastoral systems and land tenure is complex with large areas managed by landless graziers, transhumance and communal land use.

The scale of HNV farming varies from sub-parcel to part farm or whole landscapes, which often makes it difficult to draw a discrete boundary around an HNV area. The species occurring with HNV farmland depend to a large extent on specific farming systems and practices (such as the type of livestock used and the timing of grazing and hay cutting) and therefore its overall biodiversity value is often dependent on the maintenance of particular variations in the scale, pattern and timing of these across an HNV farmed landscape. Also of interest is the functional relationship between HNV farmland and other, more intensively managed land within the same farm unit, a situation common in many parts of north-western Europe.

Although pastoral livestock systems using semi-natural habitats for forage constitute the majority of HNV farmland in Europe, it is recognised that farmed landscapes dominated by partially improved grasslands, low-intensity arable and permanent crops (including orchards and olive groves) may also be of high nature value, especially where these exist in a mosaic pattern and the opportunities for wildlife are enriched by a diversity of semi-natural landscape features on farms and between farms (Oppermann *et al*, 2012).

1.5 HNV terminology used in this report

The use of the terms HNV farmland, HNV farming system and HNV farming have caused some confusion over recent years. The European Evaluation Network for Rural Development

Working Paper on the application of CMEF indicators proposed the following distinctions (EENRD, 2010):

HNV farmland refers to farmland characterised by the presence of particular land cover types and patterns (especially semi-natural vegetation and low-intensity crop mosaics) which indicate that this farmland is valuable for nature conservation. The presence of populations of particular wildlife species may also provide this indication. HNV farmland may exist at different scales, from the individual parcel to an entire landscape.

HNV farming system refers to both the land cover (farmland) and the way it is managed for production by a particular farming system and associated practices. The term implies that the system as a whole (eg at farm or even landscape level) is of high nature value, whereas HNV farmland may be limited to only one parcel in an otherwise intensive farming system.

In the present study, we follow these interpretations proposed by EENRD. The term **HNV farming** and the acronym **HNVF will be used to mean HNV farmland/farming system as a combined concept**, where a distinction is not necessary in the context. Where a distinction needs to be made, the terms will be written in full.

2 Characteristics of HNV farming in the EU

Key findings

- **HNV farming is characterised by long-established, low-intensity and often complex farming systems using labour intensive practices, livestock breeds and crop types highly adapted to local soils, vegetation and climate. HNVF farms vary in size, structure and land tenure, often using common pastures.**

- **HNV farming maintains some of the most important habitats for biodiversity in Europe. These include semi-natural habitats with high species diversity and unique species communities, as well as less natural habitats that are the main refuge for a significant farmland species. Many of these habitats and species are scarce and/or declining and the focus of conservation measures under the EU Birds and Habitats Directives.**

- **HNV livestock and mixed farming systems, which occur throughout the EU, maintain many semi-natural habitats dependent on grazing, including the traditional wooded pastures that are found on a large scale in parts of the Mediterranean and the south-east, and on a smaller scale in other regions. HNV permanent crop and arable farming systems occur predominantly in southern Member States.**

- **The role of HNV farming within the farm unit and the wider landscape affects both biodiversity value and the choice of support policies. Landscapes where most farms are managed as a low-intensity HNVF system are the most valuable for biodiversity, but no longer exist in some Member States. Where these survive they are often at high risk of abandonment or structural change damaging their biodiversity. Elsewhere, HNVF habitats such as semi-natural pastures are still a functional part of farm businesses that also depend on more intensively managed land. On fully intensive farms, surviving remnants of HNVF land, often with no functional role in the farm business, can be important for biodiversity because they to help maintain connectivity amongst habitat patches in the landscape.**

This chapter discusses recent approaches to defining HNV farmland and provides an overview of HNV farming systems and practices across the EU. It concludes with a discussion of the significance for HNV support policies of the relationship between HNV *farmland* and the *farming system* in which it is managed.

2.1 Approaches to defining HNV farmland

HNV farming systems were first described and defined as 'predominantly low-intensity systems which often involve a relatively complex interrelationship with the natural environment. They maintain important habitats both on the cultivated or grazed area (for example, cereals steppes and semi-natural grasslands) and features such as hedgerows, ponds and trees, which historically were integrated with the farming systems' (Baldock *et al,* 1993).

There are quite broad interpretations of what constitutes HNVF, largely as a result of the very different farming and environmental conditions found across the EU. The majority of HNV farmland and farming systems are low-intensity but also exhibit at least some other common characteristics of:

- adaptation to local conditions of soils, climate, water resources and, in pastoral systems, semi-natural vegetation; in some cases local breeds of livestock and varieties of crops are highly adapted to specific conditions;
- complexity in terms of diversity of land cover, crops and livestock, field structures and landscape features, tenure systems and closely integrated uses of specific areas of land;
- marginality in terms of market income, productive potential and, in some cases, relevance to the main farming system.

It is important to understand the characteristics of both HNV farm *land* and the farming *systems* within which it is found because both are relevant to the decision making processes which will determine the future of HNVF in Europe. The most important of these decisions are those made by the thousands of individual farmers who use or manage HNVF. They will frequently make day-to-day decisions about *farming practices* directly affecting their HNV land (eg when to mow hay meadows, how many stock to send to mountain summer pastures). Less often they will make decisions about their *farming systems* which may have more profound and longer-lasting impacts, particularly if the decisions mean that their HNV land is no longer an integral part of their production system (eg to change to a heavier breed of dairy cattle and convert from hay to silage making).

A key characteristic apparent from Member States' detailed maps of HNV farmland is the scale at which HNV farm *land* exists in the landscape. At one extreme are landscapes dominated almost entirely by semi-natural vegetation (generally pastures, meadows and associated landscape features) or by a mosaic of semi-natural vegetation and low-intensity cropping. At the other extreme are intensively farmed landscapes of generally quite limited nature value, but with small vestiges of semi-natural habitat in the form of hedges, copses, ponds, or areas of intensively farmed land used seasonally for feeding or breeding by birds of conservation importance. Sometimes parcels of semi-natural grassland or traditional orchards survive within an intensified farming system, typically on poorer land. In terms of European nature value (eg species richness, presence of species of European importance) these situations are not strictly comparable. Some are clearly more HNV than others. What is clear even on the small-scale map in

Although these definitions clearly overlap and remain subjective (eg in terms of thresholds for the proportions of semi-natural vegetation, species rarity and populations) they have helped clarify the HNV concept and led to further work that has attempted to map HNV farmland (Paracchini et al, 2008). The latest available EU-wide map showing the likelihood of HNV farmland, based on 2006 Corine and other data is shown in Figure 2.1.

Figure 2.1 is that in some countries and regions there are landscapes farmed largely by HNV farming systems, in which whole farms are HNV and the main farming activity is responsible for maintaining high nature value. In other countries and regions HNVF is mostly reduced to patches within a landscape of lower nature value and within farms of which a large part are not HNV and where most of the farming activity is not supporting high nature value. Member States will want to focus attention on conserving the nature value that survives in their particular farming landscape, even if this value is not very significant in the European context, but these very different situations also raise important questions about the most appropriate policy tools and methodologies required to maintain HNVF in the EU, as these are likely to vary according to the situation.

Subsequent attempts at definitions have focussed more on the HNV *farmland* rather than the farming system, driven partly by the requirements of CMEF indicator, which led to the definition of three types of HNV farmland.

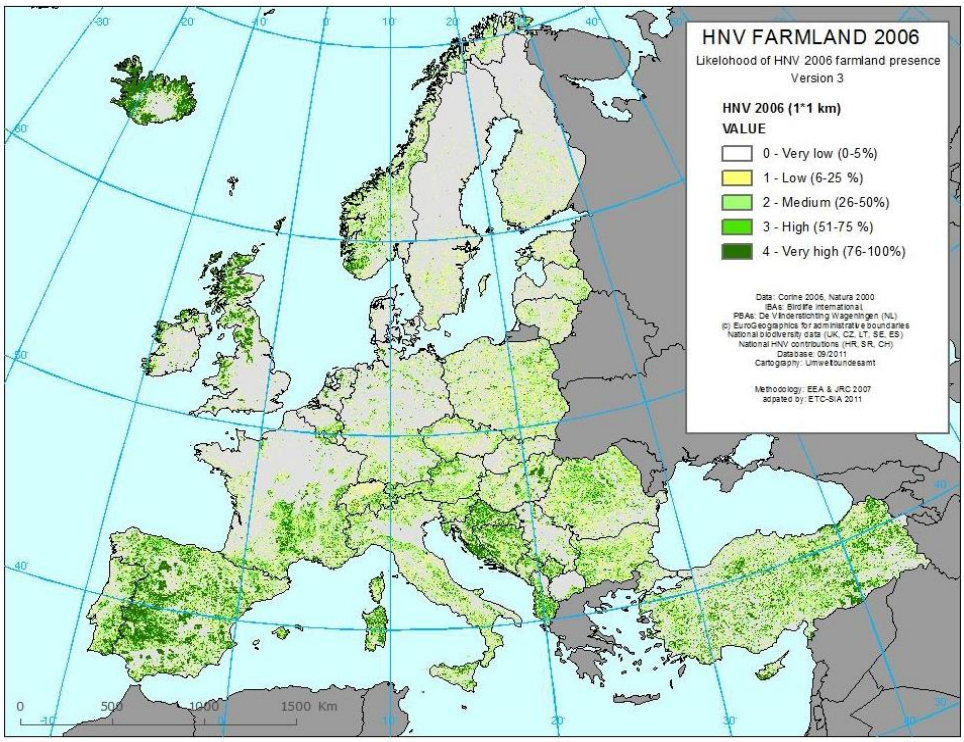
The early work carried out for European Environment Agency (EEA) on defining HNV farmland divided it into three broad categories, subsequently modified by EEA and the Joint Research Centre (JRC) (Paracchini *et al*, 2006) and shown in Box 2.1 below. These three types of HNV farmland are defined by land cover type and the presence of selected species and not intended to be precise categories with a sharp boundary between them.

Box 2.1: EEA definitions of the three types of HNV farmland

Type 1:	Farmland with a high proportion of semi-natural vegetation.
Type 2:	Farmland with a mosaic of low intensity agriculture and natural and structural elements, such as field margins, hedgerows, stone walls, patches of woodland or scrub, small rivers etc.
Type 3:	Farmland supporting rare species or a high proportion of European or World populations.

Although these definitions clearly overlap and remain subjective (eg in terms of thresholds for the proportions of semi-natural vegetation, species rarity and populations) they have helped clarify the HNV concept and led to further work that has attempted to map HNV farmland (Paracchini et al, 2008). The latest available EU-wide map showing the likelihood of HNV farmland, based on 2006 Corine and other data is shown in Figure 2.1.

Figure 2.1: EEA estimate of likelihood of presence of HNV farmland in Europe 2006



Source: EEA (unpublished)

2.2 Diversity of HNV farming systems in the EU

For the purposes of this study, the characteristic production systems within which HNVF land is managed have been identified for each Member State, based on the judgement of the case study experts. For each of these farming systems, the land cover and HNV Type (I, 2 or 3), the farming practices, nature values and socio-economic characteristics were described as far as was possible. The proportion of the overall HNVF extent in the Member State managed by each of the production systems identified was also estimated where feasible, but this was not possible in all cases. Most Member States[6] have at least five and as many as 13 different production systems supporting HNVF. Typically one or two production systems dominate HNV land management in each Member State, although other production systems managing a comparatively smaller proportion of the HNV land make a distinctive contribution to particular HNV habitats or species.

Livestock dominated production systems

As might be expected, many different types of livestock production provide the most common form of HNV farmland management across the EU as whole, and predominate in

[6] Data for DK, LT, and PL is not included in this analysis.

many Member States in the Mediterranean and south-eastern parts of the EU (Portugal, Spain, Italy, Greece, Cyprus, Romania and Bulgaria) in the north-west (the United Kingdom, the Netherlands, Ireland and France), the north-east (Sweden, Finland and Estonia) and in the Czech Republic, Austria and Slovenia in central Europe. There are many different forms of low-intensity livestock farming using Type 1 HNV semi-natural habitats as pastureland. The livestock used are mainly cattle, sheep and goats (in southern Europe), while pigs horses and buffalo are locally important. Importantly, grazed habitats include many different types of mountain and lowland semi-natural grasslands as well as heathlands, coastal dunes and salt marshes, bogs and fens; and steppes and sclerophyllous scrublands in drier areas of the south. Some grasslands used as meadows are mown for the production hay for forage and/or livestock bedding, and have high levels of botanical diversity. A striking finding is the extent to which HNV livestock farming systems across the EU use wooded pastures particularly on dry land in Spain, Portugal and Greece but also significant areas of alpine and mountain wooded pastures in Italy, Slovenia and Austria, and important but smaller fragments of lowland wooded pastures in Latvia, Estonia and Hungary. All these traditional wooded and Mediterranean scrub pasture systems are of particular biodiversity value because of their structural and species diversity[7]. They are sometimes excluded by agricultural and/or forestry policy support measures and can be at risk of perverse policy effects, for example definitions of agricultural land which exclude such pastoral HNV land from CAP support, as described in Chapter 5. These HNVF semi-natural pastures and meadows are amongst the most important and threatened habitats in Europe (Poláková *et al*, 2011; Olmeda *et al*, 2014), and accordingly a high proportion of them and their associated species require protection and management under the EU Habitats and Birds Directives and are the focus of EU Biodiversity Strategy targets.

Type 2 HNV land managed for livestock includes some semi-improved grasslands in Estonia, Finland and France. Some organic livestock farming systems on old permanent pasture may also be considered to be HNVF due to their avoidance of artificial fertilisers, limited use of pesticides, generally lower stocking levels and sometimes use of traditional breeds, as well as their tendency to retain non-farmed features such as hedges, grass strips and ditches as shelter or livestock barriers (Poláková et al, 2011). However, not all organic farmland should be considered as HNVF as the botanical diversity of some organic grasslands is reduced by the use of high amounts of slurry as fertiliser, and some may be ploughed and re-sown.

Some intensively managed grasslands support internationally important populations of bird species in winter, most notably geese and swans such as Barnacle Goose (*Branta leucopsis*) and Pink-footed Goose (*Anser brachyrhynchus*) in the United Kingdom and the Netherlands. However, it should be noted that these, and other grazing species favour young and nutritious grass and therefore now often use re-seeded and highly fertilised grasslands, rather than natural and semi-natural habitats that they formerly relied on. Management of HNVF land for such species therefore requires very different practices and support measures to the other types of HNVF that are the main focus of this report.

[7] For example more than 600 plant species have been found on wooded meadows in Estonia (source: Estonia case study).

Arable dominated production systems

Traditional low-intensity HNV arable production systems are rare at EU scale, but extensive HNV dryland cereal cropping with fallows is still found on a large scale in Iberia and to a lesser extent Hungary. These habitats have sparse crops, high crop rotation diversity and retain a sizeable proportion of fallow and the presence of patches of semi-natural vegetation and associated diverse invertebrate communities (Bota *et al,* 2005; Suárez *et al,* 1997). They are especially important for a number of globally threatened birds, including Great Bustard (*Otis tarda*), Lesser Kestrel (*Falco naumanni*) as well other European threatened species (Bota *et al,* 2005; Delgado and Moreira, 2000; Suárez *et al,* 1997; Tucker and Evans, 1997). Extensive cereal systems may also hold relatively species-rich plant and invertebrate communities. Low-intensity rice production is also found locally in Spain and Italy.

Elsewhere in Europe, HNV arable land exists predominantly within low-intensity organic systems in Type 2 HNV landscapes, or in other areas that retain some spring-sown crops (as these are less dense) and fallows. Such areas can provide breeding or feeding habitats for some farmland birds such as Lapwing (*Vanellus vanellus*), Stone Curlew (*Burhinus oedicnemus*) and Montague's Harrier (*Circus pygargus*) where other more suitable habitats do not exist.

Permanent crop dominated production systems

Permanent crop HNV land is very significant in some Member States, particularly in the Mediterranean and south-eastern Europe, although much more localised in others. Crops include traditional orchards producing a wide variety of fruits and nuts, traditional vineyards and low intensity olive and carob groves. Where the latter are very old and are subject to traditional management (eg pruning but no new planting, low-intensity grazing) the land is close to semi-natural habitat. Orchards are typically characterised by widely spaced old standard trees, often local varieties, with grass ground cover which may be grazed, for example by sheep. Orchards may be partially or completely abandoned in some areas, especially in central and northern Europe if they are now isolated within larger more intensive farm units. Permanent crops can be an important HNV resource because they provide long-established, structurally diverse habitats supporting a wide range of species.

Mixed production systems and mosaic HNV landscapes

Mixed low-intensity farming HNV (Type 2) provides a mosaic of landscape features and farmed habitats at a wide range of scales. This can support diverse wildlife communities, including populations of threatened raptors such as Red Kite (*Milvus milvus*), Lesser Spotted Eagle (*Aquila pomarina*) and Eastern Imperial Eagle (*Aquila heliaca*) in some countries where mixed HNV farmland covers large areas. These are regionally important in many Member States, for example Germany, Austria, Estonia, Latvia, Sweden, Slovakia, Bulgaria, Romania, Cyprus, Spain and Greece, but uncommon in some others eg the Czech Republic. Chapter 10 provides an indication of the proportional contribution of the main HNV farming systems within the overall HNVF area in individual Member States.

2.3 HNV farming practices

It is useful to distinguish three broad groups of farming practices that are essential to the long-term future of HNVF:

- day-to-day or other regular HNVF farming practices;

- less frequent HNVF maintenance and restoration work; and
- harmful practices which threaten HNVF and should be avoided.

These distinctions are relevant not just to understanding the way in which different HNVF systems function both agriculturally and environmentally, but also to the choice of support measures and other policy tools. The most important farming practices for different systems of HNVF land use are illustrated in Table 2.1. It is important to note that at farm and habitat level some of these practices can be quantified very precisely (for example stocking types, rates and seasons; grazing and mowing dates) and there are critical differences in these practices, depending on the type and location of the HNVF land. On the other hand, where HNV systems exist at a landscape scale the precise practices may be less important and the need for biodiversity conservation is to maintain a broadly low-intensity management system.

Table 2.1: Examples of farming practices for different systems of HNVF land

Regular, annual HNVF management practices	Less frequent HNVF maintenance and restoration management	Harmful practices which threaten HNVF
Semi-natural grasslands and other semi-natural habitats used for grazing and browsing		
• grazing with (mix of) stock types including local breeds appropriate to maintain habitat • seasonal grazing (dates vary) • grazing intensity appropriate to habitat, maintaining structural and floristic diversity, including shrubs and trees where present • shepherding on open grazing, and folding where appropriate • encourage regeneration of characteristic native tree and shrub species *Some grassland types only:* • fertilisers and lime not used or only in limited quantities • meadows mown after flowering period, normally one cut only, different parcels on different dates • manual mowing	• removal of invasive species • control of scrub if required to restore grazing to recently abandoned land • restoration or maintenance of infrastructure for livestock management (walls, fences, drinking water, drove roads)	• conversion to large scale temporary grasslands • new drainage • increased fertiliser use • use of PPP
Arable crops		
• low-intensity management of dryland crops • fertiliser limited to animal manure on farm • fallow with spontaneous vegetation • diversity of crops in small plots • spring sowing of crops • grazing after harvest • mechanical weed control	• maintenance and restoration of traditional irrigation systems (eg water meadows, gravity fed mountain systems)	• increased fertiliser use • reduction of fallow area • use of PPP • new irrigation
Permanent crops		
• low-intensity small-scale production • crops grown on terraces • mixed crops, local varieties, old trees • grazed semi-natural vegetation under and between trees • low input of manufactured fertilisers and biocides	• maintenance of terraces and walls • appropriate pruning of trees to maintain longevity • replacements using traditional varieties	• Intensive understory control through repeated tillage or herbicides • Intensive use of biocides • Irrigation

Landscape features		
• low intensity environmentally sensitive maintenance techniques (cutting reeds, hedges, cleaning ditches etc) • protection from harmful browsing and trampling, and from damage by machinery	• regular maintenance of stone walls, terraces and other built structures, using appropriate local techniques and materials • pruning and replanting woody features using local techniques/species	• removal of field boundaries, use of PPP • 'quarrying' (rock and stone walls and buildings) • drainage of ponds, wet areas, water courses

Source: own compilation

2.4 Role of HNVF within the farm business and the wider landscape

Current approaches to defining the three HNV Types on the basis of land cover characteristics (or species, in the case of Type 3) are helpful but are not intended or able to provide other essential information that is needed to design and target effective HNVF support policies. This requires information firstly about the relationship between different types of HNV and other farmland within a particular farming business and secondly about the significance of the HNVF within the wider landscape. Both of these aspects need to be better understood if Member States are to intervene effectively in reversing the continuing process of HNVF disintegration in response to powerful economic and social drivers.

It is possible to use the information gathered for this study to improve understanding of:

- the way in which HNV land (of all three HNV Types) functions within the farm unit in which it is situated; and
- the scale of its potential contribution to maintaining biodiversity and ecosystem services beyond the boundaries of individual farm units.

Better understanding of these relationships should help Member States to design and target cost-effective packages of policy support for HNVF (as discussed in Chapter 11).

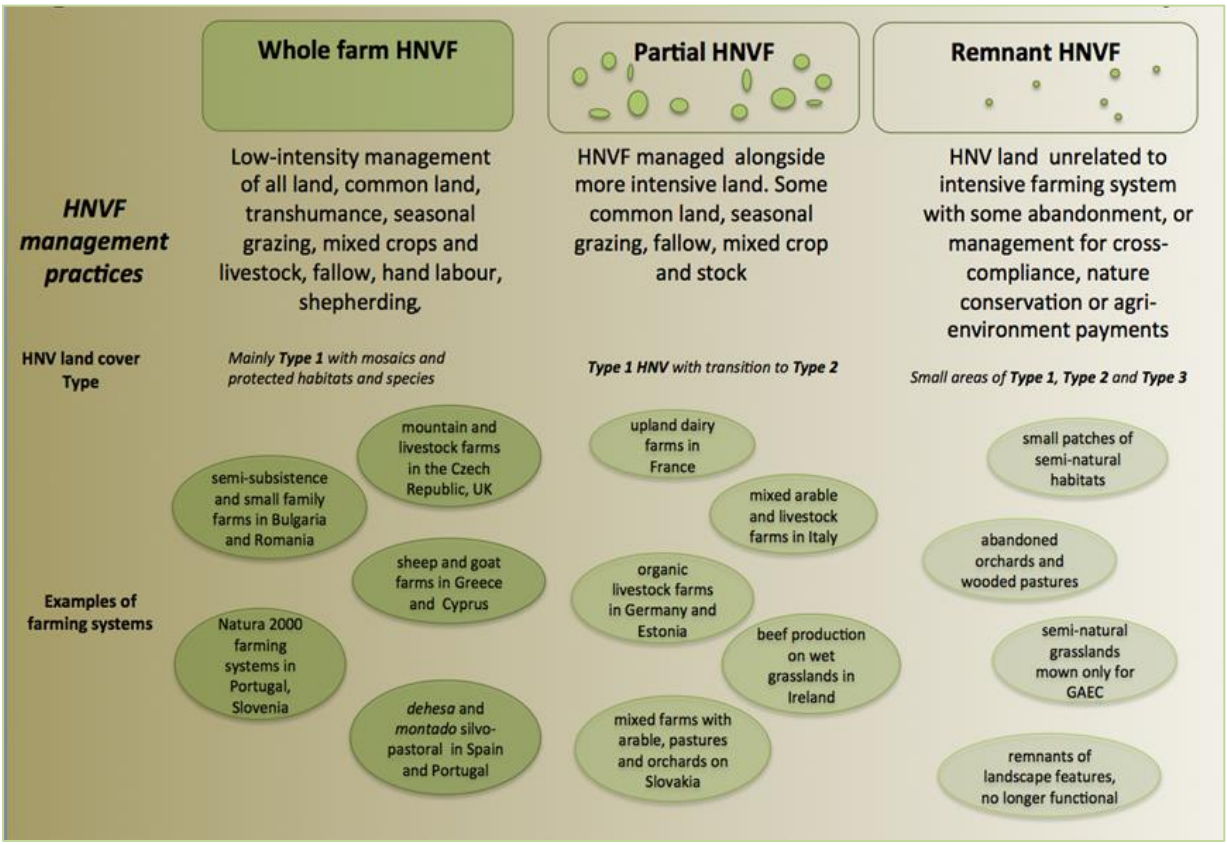
To explore these relationships the farm unit was chosen as the basic unit of analysis because this is the scale at which the key land management and production decisions are made. It is also the scale at which agricultural and environmental policy usually has an impact upon individual property rights. For the purpose of this study **the farm unit** is defined as **all the land associated with the production system, whether or not this land is currently in productive use**. In many HNV farm units the **land used may not be in contiguous blocks, or the same ownership**, **or available throughout the year** but nevertheless functions as a coherent farming system.

Three different relationships between HNVF land, the farm unit and the wider landscape are described here, but these should been seen as the opposite ends and mid-point of a continuum along which an infinite variety of relationships grade from one to another. This continuum also represents, in some cases, a sequence of changes over time as HNVF is agriculturally intensified or abandoned, and the accompanying loss of overall biodiversity value at both parcel and landscape scale because of habitat fragmentation and the loss of the 'critical mass' of particular habitat types needed to ensure a resilient population of many important species (Poláková et al, 2011). Three points on this continuum can be described as:

- **whole farm HNVF:** farms where the whole farm business is managed as a low-intensity HNV farming system, often in a wider landscape of similar farms;
- **partial HNVF:** farms where the farming business relies on low-intensity HNVF management of some of the land (often semi-natural forage areas) alongside more intensive management of agriculturally improved land, possibly for different types of livestock or at different times of the year; and
- **remnant HNVF:** farms where there is HNVF land but its land management is irrelevant to main farm business which is based on the intensive agricultural production.

These are illustrated in Figure 2.2 and discussed below, using selected examples of different systems taken from the Member State case studies.

Figure 2.2: Relative significance of HNVF within the farm business and the wider landscape



Source: own compilation

2.4.1 Whole farm HNVF

Whole farm HNVF is characterised by low-intensity HNVF systems at a landscape scale, where most of the farms and the land within an area comprise functioning HNV farming systems, adapted to the local circumstances. These farms are often mixed interdependent livestock, arable and permanent cropping systems which developed as largely self-sufficient production systems. Land cover is often very diverse across these farms, both in terms of vegetation types and structure (for example, crops and grazed semi-natural vegetation, with trees and shrubs in the form of fruit crops or wooded pastures). The farm units range in size from very large to very small and are predominantly livestock based with some cropping (fodder, arable and permanent crops). Table 2.2 shows three examples of whole farm HNVF systems.

Table 2.2: Examples of whole farm HNVF systems

Member State	HNVF land cover	HNVF system
Bulgaria (58% of HNV farmland area in Bulgaria)	Semi-natural grazing land, including species-rich and alpine grasslands. Farms grow small-scale fodder crops and other low intensity crops.	Predominantly livestock production on subsistence, semi-subsistence and small family farms with 5-20 LU, which all market part of their production; use of common grasslands for grazing and hay-making; transhumance in summer months; shepherding; no or very limited use of fertilizers on the grassland.
Hungary (15-20% of HNV farmland area in Hungary)	*Tanya*: mosaic of crops also scattered grasslands and areas of natural vegetation, tree-lines, hedges and groups of trees.	Traditional arable system of small-scale fields with complex cultivation patterns.
Spain (15-25% of HNV farmland area in Spain)	*Dehesa*: extensive permanent grazings with tree cover of up to 60 trees/ha or more, and some crops on better land. Often with a mosaic of shrub patches and other features such as streams, ponds, dry-stone walls.	Livestock rearing with cattle, sheep, goats, pigs (acorns are an important forage resource, mainly for pigs). Some local transhumance to mountains (not pigs). Cork production important in some areas. Some pastures reseeded periodically (at long intervals) to remove shrubs and improve productivity. Private land, generally in large holdings (but not all), with game shooting on larger estates.

Source: own compilation

Many of these whole farm HNVF systems have survived because they occupy agriculturally marginal land of low productive capacity where intensification may not be cost-effective, including vast areas of wooded pasture systems in the Iberian peninsula. Elsewhere HNVF farms on potentially productive land have so far have not been intensified because of transitional structural and socio-economic factors. These include, for example, the continuing processes of land restitution, restructuring and infrastructure improvement in some EU-12 Member States, as well as smaller-scale farm structures with an ageing farm population and few alternative sources of employment, also found in many regions of southern Europe. These HNVF farms are highly vulnerable because they have relatively few options to adjust production systems to absorb market pressures and many are likely to disappear.

2.4.2 Partial HNVF

Partial HNVF farms have areas of low-intensity HNVF land within a farming system which also depends on more intensively managed land. Livestock farms may have agriculturally improved grasslands on more productive soils and large areas of HNVF (for example extensive semi-natural upland pastures for summer grazing) or quite small areas (traditional orchards with grass maintained by occasional sheep grazing). Cropping systems may be in transition from coherent functional HNVF to more intensively managed systems, for example with fallows replaced by increased use of fertilisers, grasslands converted to cereal production, and ground cover in olive groves and orchards managed by herbicides rather than grazed. Table 2.3 shows three examples of partial HNVF systems.

Table 2.3: Examples of partial HNVF systems

Member	HNVF land cover	HNVF system

State		
Czech Republic	Upland semi-natural grasslands and arable crops in large parcels with few landscape features.	Large mixed farms with both intensive arable production and low-intensity grassland management
Spain	Cereals, legumes, with varying proportions of fallow and landscape elements (field boundaries, shrub and tree patches, streams, ponds, dry-stone walls in some areas).	Semi-traditional arable rotations of cereal-fallow, sometimes also with legumes. Proportion and length of fallows varies considerably. Stubbles often grazed by sheep flocks owned by landless farmer with stubble grazing rights on other farmers' arable land.
UK	Some semi-natural upland grazings on heathland, grasslands and blanket bog; lowland grasslands semi-improved.	Livestock rearing, mainly sheep with some suckler cow production. Use of common land in some areas.

Source: own compilation

2.4.3 Remnant HNVF

Remnant HNVF land is some of the most vulnerable because it is no longer a functional part of the farm within which it lies, and in some cases has been recently abandoned. These remnants may be small patches of permanent (formerly grazed) semi-natural grasslands or other vegetation within otherwise intensively managed farms, or may be whole farm units that have been abandoned. Where these HNVF remnants are still managed they often depend on CAP payments, for example SAPS or SPS cross-compliance requirements to mow grasslands or agri-environment payments for more targeted HNVF management. This management may be undertaken by other farmers (grazing rights leased out) or by nature conservation organisations, rather than the farmer. Table 2.4 shows three examples of remnant HNVF systems.

Table 2.4: Examples of remnant HNVF systems

Member State	HNVF land cover	HNVF system
Estonia	Wooded pastures and meadows.	Small patches no longer relevant to livestock production, often excluded from UAA.
Cyprus	Semi-natural scrubland and *phyrygana*, with woodland patches.	Recent abandonment of low-intensity grazing which maintained these areas.
Finland	Semi-natural permanent grasslands on arable farms with no livestock.	Grazed by cattle belonging to other farmers, or mown only (often under agri-environment contracts).

Source: own compilation

In addition to their ecological implications, these distinctions are important for policy design (as discussed in Chapter 11) because the relative significance of the HNVF land within the overall economic viability of the farm business is such an important factor in the farmer's decisions about managing HNVF land and responding to the economic signals for that particular farm coming from CAP policy and the market. This is particularly true for whole farm and partial HNV farm businesses which are almost always family farms, where CAP support is a comparatively high proportion of overall income, compared to remnant HNV farming systems where the intensive agricultural production provides significant market income.

3 Data on the extent and distribution of HNVF land in the EU

Key findings

- **Earlier estimates of the total extent of HNV farmland in the EU are based on land cover data which has well recognised limitations. This study has focused on providing more precise estimates at Member State level.**
- **The main uses for HNVF data are to target policy instruments, in particular CAP funding, and to monitor changes in HNVF land in order to assess the impact of policies and to provide evidence for future policy.**
- **There are three ways of looking at HNVF: through land cover, farming and biodiversity characteristics. Understanding all three at farm and parcel scale is important for effective policy intervention. Land cover data such as CORINE can only indicate likelihood of HNVF land cover, not agricultural activity.**
- **Although very few Member States have comprehensive semi-natural habitat information at the scale required, many have partial data that could be completed; species data is inconsistent, but bird data have been used to define Type 3 HNVF.**
- **Current agricultural data sets such as FSS and LUCAS have insufficient detail on HNV farming characteristics and practices at the scale required to give more than a general indication of possible HNVF, but could be improved with relatively small changes. EU-wide, annually updated IACS/LPIS records offer the best possibility if in future these were enriched by HNVF relevant data.**
- **Since 2008 the main focus on identifying HNVF at both EU and Member State level has been on land cover, although data on farming characteristics and biodiversity have also been used.**
- **Within individual Member States there can be several different estimates of the extent of HNV farmland, depending on the data sets and criteria used. Best available estimates of HNV farmland extent are given for each of the EU-28 Member States.**

This chapter reviews the work carried out in Member States to identify HNVF land and farms, based on information provided for the purposes of this study. All EU-28 Member States are covered, except Malta and Luxembourg[8]. Member States' experience of developing the HNV farming indicator under the Common Monitoring and Evaluation Framework (CMEF) for their 2007-13 RDPs is discussed in Chapter 7.

3.1 EU-level work since 2004 on the distribution of HNVF land

There were no pre-existing data sets explicitly on HNVF at country or regional level prior to the introduction of the EAFRD priority and CMEF indicator in 2006, as policy requirements were not established until then. The EEA had published a preliminary map of HNV farmland in 2004 (EEA 2004), based on land cover data in 2000 from the CORINE[9] data base and

[8] No HNV data was available for these two Member States, which account for less than 0.2 per cent of the HNV farmland in the EU, according to EEA/JRC data.

[9] The CORINE land cover database was started in 1985 by the European Union. CORINE (coordination of information on the environment) was a prototype project working on many different environmental issues. The CORINE databases and several of its programmes have been taken over by the EEA. One of these is an inventory of land cover in 44 classes, and presented as a cartographic product, at a scale of 1:100 000. This

farming data derived from the Farm Accountancy Data Network (FADN). These two approaches were combined to develop an EU agri-environment indicator on HNV farmland under the IRENA operation (EEA, 2005). In order to increase accuracy, the preliminary 2004 map was updated and refined (on the basis of new land cover data, refined and regionally differentiated selection criteria and additional biodiversity datasets) and published in 2008 (Paracchini *et al,* 2008). A newly updated version became available in 2012[10], based on 2006 CORINE data enriched by data from Member States and providing an estimated HNVF extent figure for all EU-27 Member States except Malta. Where HNVF figures are quoted from JRC/EEA in this report the 2012 version has been used (EEA, unpublished).

It has been made very clear by the JRC and the EEA that their data are not intended, and are not suitable, as a tool for monitoring changes in HNVF in the context of RDPs, or for targeting policy instruments at national or regional level. To identify HNVF and to estimate its extent and location with a view to developing policy tools to target HNVF, new work needed to be done within each Member State.

3.2 Types of HNVF data required at Member State and regional level

In CAP policy terms, there are two main purposes for gathering data on HNVF at Member State and regional level:

- for monitoring changes in HNVF, as required under the CMEF; and
- for targeting policy instruments at HNVF, such as agri-environment payments, in pursuit of the EAFRD priority for the preservation and development of HNV farming systems.

In other cases data has been gathered as part of research projects in Member States, without a specific policy application.

A great deal of work has been carried out in many Member States to identify HNVF, especially through mapping exercises. In most cases this work has been prompted by the need to produce the CMEF indicator on HNV farmland, although some work has been undertaken to identify and describe HNVF for other purposes. This chapter covers overall data availability and work done to identify HNVF in Member States, not only that which has led to the definition of the CMEF indicator.

An important distinction should be made between tools (eg data sets, thresholds, definition of baselines etc) that are intended for the purposes of monitoring HNVF under the CMEF requirement, and tools that are intended for targeting policy instruments at HNVF. Although these two groups of tools may sometimes overlap, it should be made clear from the start of any data collection work that the technical requirements are different. For example, monitoring can be achieved through sample surveys (as in Germany) whereas effective targeting of support measures cannot. Conversely, a map designed for targeting support at certain HNVF zones may be unsuitable for monitoring changes in HNVF.

For the purposes of designing and implementing HNVF policy, two broad types of data should be considered:

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database is operationally available for most areas of Europe. http://www.eea.europa.eu/publications/COR0-landcover

[10] It is unclear when the 2012 update of Parrachini *et al* (2008) will be published.

- data for indicating the approximate extent and location of HNVF. Generally this will be numerical and cartographic data;
- data on the characteristics of the identified HNVF, the tendencies in HNVF that are apparent from studies and expert knowledge, and the apparent challenges to its survival. In some cases this will be numerical data, but descriptive and explanatory information is also essential.

Most work to date has been on the extent of HNVF (hectares of HNV farmland) and has been driven by the requirement to define the baseline CMEF indicator, but data on HNVF extent is also important as the basis for determining budgets and other resources required for schemes to support HNVF. Across the majority of Member States there has been a particular focus on producing approximate maps of HNVF spatial distribution, following the example of JRC/EEA at EU level. However, although cartographic information helps to provide a picture of where HNVF is concentrated, unless this information is extremely accurate (at holding or parcel level) it is of little value for monitoring purposes and may be questioned as a suitable tool for policy targeting.

Information about HNVF characteristics, tendencies and challenges is crucial for the design of effective support measures. Good data on the location of HNVF at holding or parcel level can be a valuable tool for targeting support measures, and is already used in some countries (eg Slovakia, Czech Republic). However, the location of HNVF on maps is not essential for this purpose, as shown by the many effective agri-environment schemes that have operated over the years without maps, using instead eligibility criteria and requirements of the scheme to determine which farms are able to participate (eg only a farm with an extensive grazing system can participate in a scheme to support extensive grazing).

Information about HNVF characteristics, including the socio-economic situation on these farms, is also highly relevant to monitoring. In fact it is has been recommended by the EENRD that monitoring HNVF should not be limited to estimating its extent, but should also aim to gather information on the changes taking place in farming systems and practices, and in the socio-economic situation of HNVF (EENRD, 2010). In this way, monitoring can generate valuable information to feed into policy improvements and greater policy efficiency.

To summarise, key points to bear in mind about HNVF data include:

- most of the work to date has focussed on estimating the spatial extent of HNVF and generating indicative maps of HNVF;
- for monitoring purposes, estimates of the extent of HNVF must be drawn from data sources that are regularly up-dated. Data that is collected once but not repeated is of no use for monitoring;
- to be sufficiently robust for HNVF policy design, targeting and monitoring, maps of HNVF need to be accurate, preferably at the parcel level. Broader, indicative maps provide a visual impression of distribution across the territory, but are of limited value for policy implementation;
- the capacity to distinguish accurately between HNV and non-HNV land at parcel level would be needed if HNV status were to become an eligibility criterion for a direct payment under the first pillar of the CAP.

3.3 Overview of progress in defining HNVF at Member State level

Since 2006, at least some work to identify HNVF has taken place or has recently started (in 2012-13) in all of the 26 Member States for which information is available. There no longer seems to be any Member States where nothing has been done to identify HNVF. However, the amount of work that has been done varies considerably. As a result, the picture of data availability on the extent and location of HNVF in the EU is a complex one, although with some common threads.

Some countries have undertaken several years of detailed work to pursue the identification of HNVF, to estimate the extent of HNVF and in some cases to establish a functioning indicator and monitoring system. Generally this work has been initiated and commissioned by national or regional Ministries themselves. Sometimes the work has been undertaken 'in house', but more often the work to identify HNVF has been contracted out to universities and research institutes, although often with close Ministry involvement. Examples of countries or regions where there have been several years of work, and concrete outputs in terms of indicators and/or targeting mechanisms, include Austria, Belgium (Flanders), Finland, Hungary, Navarra (Spain), Netherlands, Portugal, Slovenia, Scotland (UK) and Sweden.

A specific example concerning the development of HNVF indicators is Germany, where the Federal authorities and Länder decided at an early stage to establish a new, purpose-built system for estimating the extent of HNVF and monitoring changes, by means of regular sample surveys. This system has now been operating for several years and is the only example to-date of a purpose-built HNVF monitoring system with its own data gathering.

Within another group of countries, for example Estonia or Italy, considerable work has been undertaken by, or directly for, the authorities, which is still on-going but not yet incorporated (or only partially incorporated) into effective policy mechanisms. Several other Member States have produced initial maps and estimates of HNVF extent that have had some limited policy application, but where the work still needs considerable development, for example Lithuania.

In Bulgaria and Romania, HNVF maps were produced primarily for the purpose of targeting policy instruments such as agri-environment payments, but refinements to the methods are needed which have not yet been addressed (although work has recently been started to review the HNVF map in Bulgaria).

In some cases, initial work has been completed but not followed up or adopted for policy purposes, resulting in a lack of concrete progress in recent years. Typically, in these cases the work was not initiated by the authorities directly responsible for RDPs; for example in England, Greece and Spain.

Finally, there are Member States where there has been limited or no progress until recently in identifying HNVF, but where Ministries are now taking more interest in the subject and have commissioned new work (eg Denmark, France, Ireland), or have consulted experts on how to take forward the HNVF challenge (eg Czech Republic, Latvia, Slovakia, Poland).

3.4 Different approaches to defining and identifying HNVF at Member State level

Working out the extent and location of HNVF presents considerable challenges, and there are no simple solutions. In fact it could be said that there is no single solution; rather, HNVF can be looked at through several different lenses, and each will give a different result.

Broadly, there are three ways of looking at HNVF. These can be summarised as:

- **Land cover** characteristics indicative of HNVF:
    - semi-natural land cover, especially pastures and meadows, orchards, patches of semi-natural vegetation, hedges, ponds, etc;
    - mosaic patterns of farmland, eg small parcels, with a high density of field boundaries.
- **Farming** characteristics and practices indicative of HNVF
    - low use of inputs, low livestock density and specific practices such as shepherding, late hay-cutting, orchard grazing and arable fallowing.
- **Biodiversity** indicators of HNVF
    - the presence of farmland habitats and/or species of conservation concern[11] as a direct indication of HNVF.

Table 3.1 summarises these three ways of looking at HNVF, the data sources available for identifying the presence of the different characteristics and the associated problems that have been reported. There is a clear need, from the point of view of policy design, to understand, influence and monitor all three aspects because no single one of these three approaches can give a complete picture of HNVF, even if there were complete data available for that approach. In practice, data are very far from complete in all three areas. For example, a semi-natural pasture from a land cover database usually is taken to be HNVF, but without farming data we cannot be sure it is in farming use, nor if that use (eg farming intensity) is appropriate to conserving its semi-natural state. Ideally, to monitor accurately the nature value of the pasture data on its species composition would be needed.

This means that we are always looking at HNVF through three imperfect lenses. This is the challenge with which Member States struggle. The following overview shows how Member States have attempted to define HNVF to date using data sets on land cover, agriculture and biodiversity.

[11] For example those identified in the Habitats Directive and the Birds Directive.

Table 3.1: Overview of data options for Identifying HNVF, problems encountered and proposed solutions

Approach to identifying HNVF from data sets	Possible indicators of HNVF	Advantages of the approach	Problems encountered	Currently available data sources						Proposed solutions to the problems identified
				CORINE	National land cover and land use data	IACS/LPIS	FSS, FADN, national census	National habitat inventories	National species inventories	
Land cover	Semi-natural vegetation (pastures, meadows, orchards, landscape elements). Arable fallows.	Relatively simple to generate maps and visualise distribution.	Distinguishing semi-natural grasslands from more intensive grasslands is problematic, similarly for orchards. Using habitats data is one option. Landscape elements only shown on very high resolution land cover systems.	CORINE land cover categories not helpful as they put intensive and semi-natural grasslands in one category, ditto orchards. Arable fallows not shown. Landscape elements not shown. Does not identify use of the land (farming or not).	Some national land cover data includes categories that *a priori* are HNVF, eg non-improved grasslands on UK Land Cover	Some pasture categories on LPIS are *a priori* HNVF eg, in Bulgaria, Spain. LPIS includes arable fallows in Spain. Landscape elements are visible on some LPIS (aerial photos), and are marked in some cases.	Not relevant	Potentially very valuable complement to land cover, but very few countries have complete and up-to-date inventories covering semi-natural farmland habitats.	See below	Complete national inventories of semi-natural farmland integrated with LPIS at parcel level, as in Slovakia. Record landscape elements on LPIS in all MS.
	Mosaics of farmland with semi-natural elements	As above	Determining thresholds is a big challenge. Low intensity farming is a key HNVF indicator in the case of crops mosaics, so need farming data to complement land cover	CORINE has a mixed category that some methods have included as representing Type 2 HNVF		LPIS shows parcel boundaries and parcel use in most MS (not all new MS) so very valuable data set for calculating and monitoring mosaic patterns.	Not relevant	As above	See below	All LPIS in all MS to include parcel boundaries and parcel land use.
Farming characteristics and practices	Low use of inputs, including livestock per hectare, seasonal grazing, arable fallows	Potentially complementary to land cover data, eg to determine if a pasture is in farming use, what is the LU/ha, input use on cropped land, etc. Potentially important data for the evaluation of RDP effects, since measures impact primarily on farming practices	Very little data available and then only at level of administrative regions. FADN excludes economically smaller farms (often HNVF).	Not relevant	At holding level, the only intensity data widely available is LU/ha, but not in all countries, and often of doubtful quality for a variety of reasons (not all livestock counted, not all land counted).	Certain practices can be extracted from IACS/LPIS, particularly LU/ha and arable fallowing.	Very little data available and then only at level of administrative regions. FADN excludes economically smaller farms (often HNVF).	Not relevant	Not relevant	Make categories and data collection more relevant and complete, eg include common grazings, include all livestock and farmed land in LU/ha calculations
Biodiversity	Presence of habitats of conservation concern.	Habitat data often crucial for distinguishing semi-natural grasslands from more intensive.	Inconsistent and partial data, not regularly updated	Not relevant	Some national land cover data includes categories that *a priori* are HNVF, eg Non-improved	Landscape elements protected by cross-compliance are recorded on LPIS in some countries. These data could be harmonised with	Not relevant	Potentially very valuable complement to land cover, but very few countries have complete and	Not relevant	Establish complete inventories for all MS and regularly update.

					grasslands on UK LandCover	national habitat data		up-to-date inventories covering semi-natural farmland habitats.		
	Presence of species of conservation concern. Species richness. Species abundance.	Useful for land that does not have HNVF characteristics but nevertheless supports species of conservation concern (HNVF Type 3)	Inconsistent and partial data, not regularly updated	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Some countries have far more data than others. Some have quite good data for certain taxa, especially birds, but mostly very poor for other taxa. Geographical coverage is highly variable and rarely complete. Spatial resolution generally is poor, eg presence/absence of species in a 10x10 km square. Data are often not recent and time series data are available for few species.	Species data potentially useful for monitoring condition of HNVF, but through new sample surveys rather than existing 'static' data sets.
	Designations such as Natura 2000, IBA, PBA	Used in some countries as a filter to select land cover types that cannot be identified as HNVF through other data, especially croplands	Boundaries are generally static	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	

3.4.1 Land cover data

Early attempts to define HNVF tended to follow the lead of the JRC/EEA in using a combination of CORINE land cover and data on species distribution and/or protected area designations. In many cases this approach was found to be problematic, due to the unsuitability (for HNVF identification) of the land cover categories used by CORINE; the very patchy nature of species data; and the lack of regular updating in both case. Monitoring changes in the spatial extent of protected areas designations is of little relevance as a tool for monitoring the *extent* of HNVF as generally the boundaries of these designations are static (although of course it is important to monitor the condition of HNVF within protected areas and elsewhere).

Many countries decided, in accordance with the JRC/EEA and with the HNV guidance document of the European Evaluation Network for Rural Development (EENRD, 2008), that semi-natural farmland is the core of HNVF and that identifying this semi-natural land (Type 1 HNVF) is a basic first step in identifying HNVF. However, CORINE land cover data are not suitable because they do not distinguish extensively managed semi-natural grasslands and orchards (including olives) from intensively farmed grassland and orchards. Technically this may be possible with remote sensing technology and therefore the distinction could be made on land cover data sets, but CORINE does not contain such categories.

To address this issue, experts in many countries turned to national inventories of semi-natural habitats (primarily grasslands, including wooded pastures and meadows), for example in Estonia, Finland, England, Lithuania, Slovakia and Sweden. However, such data sets are incomplete in the great majority of countries. It seems that only Slovakia and Sweden have almost complete inventories. In some cases, semi-natural habitat inventories cover the whole country, but only for priority habitats or sites[12], providing only a partial picture of semi-natural HNVF (eg in Estonia and England). If complete inventories of semi-natural farmland were produced in all countries, this would allow accurate identification of the core of HNVF.

Mosaics of low-intensity cropping with a high density of semi-natural elements (Type 2 HNVF) are another aspect of land cover, but one widely reported as difficult to address, not least due to the problem of deciding where to draw the distinction between what should be defined as HNV and non-HNV. Whereas semi-natural farmland can be identified at parcel level, Type 2 HNVF mosaics must be addressed at a landscape scale. The difficulty is in the definition of quantified thresholds for separating HNVF mosaics from non-HNVF mosaics, in terms of diversity of land use types, size of parcels, density of boundary features, etc. For monitoring purposes, it is not so important precisely where this distinction is drawn, but that it is drawn consistently as a baseline against which to monitor changes; the important thing is to be able to quantify the change that occurs against the baseline, not the precise baseline itself. Defining, identifying and estimating the extent of Type 2 HNVF has been the most difficult challenge for most Member States. In several cases, the Land Parcel information System (LPIS) has been used as the most effective data set for identifying land

[12] Habitats and/or sites that are identified as priorities in nature conservation legislation, analogous to Annex 1 habitats and Natura 2000 sites at EU level.

cover mosaics, as it is the only up-to-date data set that records land parcels (except in some new Member States).

3.4.2 Data on agricultural characteristics

The use of agricultural statistics, drawn from sources such as the Farm Structure Survey, FADN, national farm census and LPIS/IACS, has been tried in a few countries, including England, Italy, Portugal and Scotland. The approach taken has been to select categories of farm holding that can be expected to be HNV on the basis of criteria such as livestock densities and proportion of the farm under permanent pastures or fallow. The estimated extent of HNVF is a function of the sum of the farms that meet the defined criteria. In Italy, this approach has been trialled using both FSS and FADN data, in both cases producing a very different figure from the estimate generated through a land cover approach. As shown in Table 3.1 there are fundamental limitations of the available agricultural data sets, such as insufficient detail on farming characteristics and practices and low levels of geographic resolution, that make their use for HNVF identification a rather crude and approximate exercise.

There are some exceptions, with IACS/LPIS data sometimes providing the most useful information. For example, in Austria the intensity of grassland use is recorded on IACS/LPIS in the form of the number of cuts of hay that can be taken from a field, and was used to distinguish less intensively farmed grassland; but this information is not recorded on IACS/LPIS in most countries. In Spain, the proportion of fallow land in arable systems can be extracted from IACS data. In Portugal the government's identification of HNVF draws entirely on IACS/LPIS data at holding level, including criteria such as livestock density, proportion of farmland under fallow and permanent pasture, presence of dryland permanent crops and parcel and land cover diversity.

3.4.3 Biodiversity data

Attempts to use species data as a key indicator of HNVF have not been particularly successful, with the exception of bird data for Type 3 HNVF in some cases, for example Navarra (Spain). National maps have been generated using data for a suite of species as an approach to identifying HNVF generally (not just Type 3 HNVF), for example in England and Spain. But such data are generally very patchy, in the sense that: there are far more data for certain taxa, especially birds, than for others, with the result that some farmland habitats are poorly represented; geographical coverage is highly variable and rarely complete; the spatial resolution generally is poor (eg presence/absence of species in a 10x10 km square); data are often not recent; and time series data are available for few species. Local ground-truthing in England found the species layer of the trial HNVF map produced by the government conservation agency Natural England to be very unreliable at local level (Beaufoy and Jones, 2012). The Spanish map has not been ground-truthed.

An important decision faced by those undertaking work to estimate the extent of HNVF is whether to combine all three approaches described above, typically by overlaying them on a GIS; or whether to keep them as separate approaches that can be analysed and monitored in parallel. Some countries have taken the combined approach (eg Estonia) while others have kept them separate (eg Italy, Scotland).

To summarise, key points on identifying the extent and location of HNVF:

- Accurate data at parcel level on the presence of semi-natural farmland (including landscape elements) are the essential prerequisite for robust identification of HNVF. Very few countries have such data in a consistent, comprehensive and up-to-date form, although many have partial data that could be completed.
- Species data also are very inconsistent and cannot be relied on for general identification of HNVF, but can be used for identifying limited cases of HNVF Type 3, especially for bird species.
- Farming data sets, such as FSS, can be used to estimate the extent of very broadly defined farm categories that may coincide approximately with HNVF in some regions, particularly extensive livestock holdings, but there are significant data gaps (eg where common grazing land is excluded from FSS).
- LPIS and IACS are potentially the most useful data sources for the identification of HNVF, because of the level of detail at parcel level and because they are regularly updated. They could be enriched with some additional data for HNVF purposes relatively easily. Access to IACS data can be difficult for research bodies but this problem has been overcome in several Member States.

3.5 Member State estimates of the extent of HNVF land

In estimating the extent of HNVF land, value judgements must always be made. The data themselves cannot tell us what is high and low nature value without a decision being made on the point at which the data is indicating a high value. Furthermore, all methods for estimating the extent of HNVF are handicapped by the inadequacies of currently available data, with the result that estimates can only be very approximate. Thus there is often no single definitive answer for a given country or region as to the extent of HNVF. Indeed, in many cases there are several different figures available, including for example the JRC/EEA estimate, the estimates produced by one or more national/regional studies, and the figure quoted as the CMEF baseline. In some cases the differences are extremely large, for example in Austria, Finland and Spain.

In some cases, national studies have taken a figure already determined from other studies, and then set criteria thresholds to produce approximately the same figure. For example, the Solagro report in France (Pointereau *et al* 2007) was designed to match the pre-existing JRC/EEA estimate for France, while in Spain the MARM study (Olivero *et al* 2011) set the threshold for HNV such that the resulting map for Navarra was similar to that produced from a pre-existing regional study.

The main available estimates of the extent of HNVF land in each Member State are shown in Table 3.2. For most Member States there are two estimates shown, a high estimate and a low estimate for the extent of HNVF in hectares. The source of these estimates varies considerably. Where only one estimate of the extent of HNVF currently exists, the same figure has been used for both high and low estimates, eg Ireland. In some other cases, one of several available estimates is, according to expert judgement, the most reasonable or reliable. In such cases we have used this one figure for both high and low estimates (eg Bulgaria). In some cases these figures correspond to the results of official or independent national or regional studies, in other cases the figures are estimates produced on the basis of expert opinion. Where no complete estimate was available from national sources, the figure from JRC/EEA is quoted (EEA, unpublished).

In the case of Austria the work undertaken for the government produced two estimates of HNVF extent (high and low) by adjusting the thresholds applied through their methodology. These official high and low estimates of 1,137,779 hectares and 287,978 hectares respectively are used In Table 3.2. The most recent JRC/EEA figure for Austria was 2,140,879 hectares but this has not been used as the high estimate because the national methods and sources are more closely adapted to conditions in the country and therefore seem more robust. It is indicative of the problems facing Member States that for this one relatively small and data-rich country the HNVF estimates range from less than 300,000 to over two million hectares.

In the UK, only Scotland has an official estimate of HNVF extent. For consistency a common approach has been used here to produce 'expert estimates' for the UK as a whole based on interpretation of available land cover data. The same approach was taken for the estimates given here for France and the higher estimate for Spain. In the case of the UK and France, the estimates are focused on semi-natural land and do not take account of possible arable or permanent crop HNVF.

The figures quoted by some Member States for the CMEF indicator can be very different from other estimates of HNVF extent, even within the same RDP document. For example, the CMEF figure quoted in the RDP for Bulgaria is 400,000 hectares, whereas elsewhere in the same document the extent of HNVF is given as 1.6 million hectares. The JRC/EEA figure for Bulgaria is 2.6 million hectares, but this is not considered a reliable estimate. In the case of Estonia, the CMEF figure is limited to semi-natural farmland within the Natura 2000 network, although this is recognised as being a small subset of the baseline extent of HNVF in the country. For this reason we show the JRC/EEA figure in the table. At the other extreme, Romania cited the target HNVF area for agri-environment and LFA measures as 5.9 million hectares, which probably is considerably more than the total extent of HNVF in the country. For this reason the figures we show in the table are the JRC/EEA estimate and the HNVF designated area cited in the RDP (as distinct from the target area referred to above). Given that the types of estimate vary greatly from country to country, and that within countries there are often several different and often confusing estimates available, the data limitations mean that it is simply not feasible to generate a total EU estimate of HNVF by adding up national figures and therefore this has not been attempted.

Table 3.2: Overview of available estimates of HNVF extent by Member State for EU-28

Member State	Estimated extent of HNV farmland		Source of estimates
	high (ha)	low (ha)	
AT	1,138,000	288,000	Both were calculated for work for the Ministry with the minimum estimate using more restrictive criteria.
BE Flanders	435,153	151,000	The higher (whole of BE) is JRC/EEA, the lower is from work done by Ministry.
BE Wallonia		69,000	The higher (whole of BE) is JRC/EEA, the lower is farmland coinciding with Main Ecological Infrastructure.
BG	1,630,035		Work done for Ministry.
CY	343,209	110,000	The higher estimate is from JRC/EEA and the lower is found in the RDP.
CZ	550,000		Both the RDP and the expert report arrive at a roughly similar estimate.
EE	531,554		JRC/EEA

FI	1,268,980	259,739	The higher estimate is from JRC/EEA and the lower is in a study for Ministry.
FR	7,000,000	4,000,000	Both are author's estimate of semi-natural farmland based on national land use data TERUTI.
DE	2,201,146		Official survey for CMEF indicator showed 13% of farmland to be HNV. The figure shown here is 13% of UAA.
DK	191,262	130,000	Higher estimate is from JRC/EEA, lower estimate is as used in the RDP (extensive farming within Natura 2000).
EL	4,467,000		Study for Ministry by Hellenic Ornithological Society using Corine and species data.
HR	3,077,230		JRC/EEA
HU	1,935,454	900,000	The higher estimate is from JRC/EEA and the lower is designated HNV areas from the RDP.
IE	1,154,495		JRC/EEA
IT	6,227,983	3,064,322	The higher is the INEA land cover estimate and the lower is the INEA farming data (FSS) estimate.
LT	913,522	640,277	The higher estimate is from a study for the Ministry, the lower figure is from JRC/EAA.
LU	13,637		JRC/EEA
LV	569,534		JRC/EEA
MT	No figure available		
NL	288,235		Alterra study for the Ministry.
PL	4,488,811		JRC/EEA
PT	3,810,878	3,260,110	Both figures are from the work commissioned by the national Ministry. The high figure is the estimate for all HNVF, the low figure is the estimated HNVF within the UAA.
RO	5,221,251	3,320,000	The higher estimate is from JRC/EEA and the lower is from the RDP.
SK	772,454	364,454	The higher estimate is author's estimate based on semi-natural grassland, mosaics, abandoned grassland and Natura 2000 arable land. The lower is estimate is that of consulted national experts, based on semi-natural grassland and mosaics.
SI	473,116	441,721	The higher estimate is from Ministry calculations of HNVF extent and the lower is the latest calculations for CMEF.
ES	25,000,000	14,500,000	The higher estimate is the author's estimate based on land use statistics and LPIS. The lower estimate is quoted in the National RDP Strategic Plan drawing on CORINE.
SE	1,166,103	844,400	The higher is JRC/EEA and the lower is the Ministry official figure from the national TUVA database.
UK	7,910,000	6,590,000	Author's estimates, the higher based on semi-natural grassland + 20% (as estimate of semi-improved grassland), the lower based on the extent of semi-natural grassland from national data sets

3.6 Data on HNVF characteristics and challenges

In most countries very little work has been done on the characteristics of HNVF and the challenges facing these farmers. This seems to be because the main focus has been on mapping exercises following the JRC/EEA lead, so that HNVF has been looked at mostly

through the optic of the JRC/EEA typology (HNV Types 1, 2 and 3). There has been much less attention given to understanding and describing the characteristics of the farming systems themselves and the economic and social pressures the farmers face.

The situation is a little different in Member States that have implemented measures explicitly targeted at HNVF, such as Bulgaria and Romania. In these cases the RDPs provide some description of HNVF types, tendencies and challenges (Box 3.1 shows an example from Bulgaria).

It is also the case that the RDPs of some other Member State and regions refer in relatively simple terms to broad HNVF systems and to their socio-economic challenges and on-going decline, even though they do not necessarily implement measures explicitly for the support of HNVF.

Box 3.1: Description of HNVF from the Bulgaria RDP 2007-13

Permanent grasslands, most of which are semi-natural, cover approximately 34 per cent of the utilised agricultural area (in the year 2004). The semi-natural grasslands are among the most valuable ecosystems of the agricultural landscape. They result from continual agricultural practices utilizing the grasslands for grazing and/or mowing. The semi-natural habitats in Bulgaria experience different types of pressure, which causes their biodiversity to drop:

- Following the huge decline in the numbers of livestock during the 1990s and the continuing low prices for milk and meat, many high nature value pastures are now under-grazed or abandoned. As grazing is reduced or abandoned, so is the mowing of meadows and a process of succession begins with the intrusion of shrubs and trees into the grassland and the dominance of more competitive grassland species.
- With the poor economic returns from keeping grazing animals on semi-natural grasslands, many farmers in lowland areas and on more fertile soils resort to the conversion of grassland to arable crops, vineyards or orchards. This results in irreversible loss of plant diversity and subsequent disappearance of associated invertebrate and vertebrate communities;
- When semi-natural grasslands are owned by municipal authorities and located close to settlements, they are often used for common grazing by local people. In contrast to the pressures, described above, this often leads to over-grazing and pasture degradation with the loss of all.

Source: Bulgaria RDP section on Environment and Land Management (Bulgaria case study)

4 Overview of EU legislative protection for HNVF

Key findings

- **Under the Birds and Habitats Directives, Member States must act to conserve threatened habitats and species in Europe. Within these are 57 types of habitat and 257 species that depend on or are associated with HNVF farming activities. Despite this requirement more than more than 75 per cent of these habitats and at least 70 per cent of the species are in unfavourable conservation status.**

- **Within most Natura 2000 areas, legally binding requirements and site management plans have only limited influence on farming. Some threatened habitats lie outside Natura 2000 sites, where farmers' obligations to protect habitats and species of European importance are often poorly defined and EU legislation weakly enforced. Pro-active conservation management of these 57 farmland habitats thus relies largely on voluntary action by farmers, and support provided by agri-environment schemes.**

- **Member States definitions of GAEC cross-compliance standards for CAP payments in 2007-13 had a mixed impact on HNVF. In some Member States standards for minimum stocking densities helped to prevent under-utilisation of pastures; elsewhere standards requiring only mechanical clearance of vegetation risked deterioration of semi-natural habitats and loss of HNVF diversity. Protection of terraces was potentially beneficial but too costly for famers. Requirements for removal of 'unwanted' vegetation were helpful where applied sensitively, for example to remove invasive alien species or control excessive scrub invasion, but damaging when they led complete removal of non-herbaceous elements of HNV semi-natural habitats.**

- **For 2015 -20 the cross-compliance framework is simpler. The effects on HNVF will depend on how Member States define both GAEC standards for landscape features and the new minimum 'agricultural activity' requirements for grazed HNVF land, especially non-herbaceous semi-natural pastures.**

This chapter examines firstly the extent to which EU legislative protection is provided for HNVF under the Birds and Habitats Directives, and secondly considers the extent to which Member States' definition of GAEC cross-compliance standards have provided additional HNVF protection or have acted as a barrier to appropriate management on HNV farms during the 2007-13 period.

4.1 Legislative protection for HNVF under the Birds and Habitats Directives

The Birds[13] and Habitats Directives[14] form the main legal framework for the protection of nature and biodiversity in the EU. The principal aim of the Birds Directive is to ensure that '*Member States shall take the requisite measures to maintain the population of the species referred to in Article 1*[15] *at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level.*' This concept was further developed in

[13] Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds.
[14] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
[15] All species of naturally occurring birds in the wild state in the European territory of the Member States to which the Treaty applies.

the Habitats Directive, which aims to '*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*.'[16]

The principal means of achieving the aims of both Directives (at least for most species) is through the protection and conservation management of sites that are particularly important for EU biodiversity. These include protection measures for Sites of Community Importance (SCIs), which must be designated as Special Areas of Conservation (SACs) by Member States under the Habitats Directive (for habitats and species of Community interest), and Special Protection Areas (SPAs) designated under the Birds Directive (for birds listed in Annex I of the Directive and for migratory species). These SACs and SPAs for habitats and species of European conservation concern[17] are combined under the Habitats Directive with the intention of forming 'a coherent ecological network' referred to as the Natura 2000 network.

There are 57 habitat types of Community interest defined in the Habitats Directive that are partially or fully dependent on agricultural activities (Halada *et al,* 2011; Olmeda *et al,* 2014). In addition, at least 257 species listed in the Directives are associated with farmland. Consequently farmland makes up around 40 per cent of the total area in the Natura 2000 network, which highlights the importance of HNV farming for biodiversity conservation in Europe.

The Habitats Directive also requires Member States to monitor the condition of habitats and species of Community interest. The latest assessment, completed in 2006, revealed that 76 per cent of these farmland habitats and 70 per cent of farmland species had an unfavourable conservation status (ETC/BD, 2008a). The types of threats reported are similar to those threatening the survival of HNV farmland more widely (Olmeda *et al,* 2014). Member State assessments of the condition of bird populations are yet to be published, but the most recent evidence indicates on-going declines in populations of the rarer threatened farmland species (Birdlife International, 2004).

4.2 Legislative protection of HNVF within the Natura 2000 network

The way in which Member States have implemented the Habitats Directive through domestic legislation and processes affects the extent to which the Member States' legal obligations for land management within Natura 2000 sites are transposed into restrictions on farmers' and land owners' property rights. Member States deploy a wide variety of binding and voluntary measures, which may be supplemented with incentives for appropriate management.

4.2.1 Ensuring appropriate management of farmland within the Natura 2000 network

Member States must ensure that habitats and species within the Natura 2000 network are managed according to defined *conservation measures*[18], including restoration where necessary. Under the Habitats Directive, conservation measures must correspond to the ecological requirements of the habitats and species of Community interest present in the

[16] These are habitats and species that are listed in Annexes I and II of the Directive respectively.

[17] For brevity we refer in this report to species and habitats of Community interest and birds listed in Annex 1 of the Birds Directive and migratory birds as species and habitat of European Conservation Concern.

[18] As defined in Habitats Directive Article 6.1 and Birds Directive Article 3.3b.

site, in order to achieve favourable conservation status (as defined in the *conservation objectives* for the site). Requirements under the Birds Directive are similar. Most Member States define conservation measures in site management plans (though other statutory measures such as hunting law, public forestry management and protected area regulations are also used to define the acceptability of certain activities) (European Commission, 2012). Multiple-site or regional plans or species action plans can be used for overlapping or small sites.

Farmers and land owners are obliged to comply only with those conservation measures for Natura 2000 land that are defined in legally binding statutory measures. In principle these obligations form part of the reference level for public payments as they are not eligible for compensation, except via the EAFRD Natura 2000 measure which is explicitly designed to compensate for the obligatory measures. The extent of binding obligations on farmers appears limited in some countries, more widespread in others; often compensation for restrictions is not available. However, this is a complex area and no reliable inventory of the relevant national and more local arrangements seems to be available. There are also important questions about the extent to which site management plans and other tools for fulfilling conservation goals on Natura sites translate into concrete requirements at farm level. Most policy documents defining conservation measures for Natura sites, such as management plans, are only binding on the relevant management authorities rather than directly on farmers. The relevant management authorities do not necessarily have recourse to powers to influence the forms of farm management which would be most appropriate (Bouwma *et al,* 2010). Furthermore, though around half of Member States have finalised management plans for most or all of their Natura 2000 sites[19], a number of Member States still do not have management plans or other statutory instruments for a large proportion of their Natura 2000 area, including much of the HNV farmland[20] (European Commission, 2010).

Where Natura 2000 site management plans are present, they are often relatively generic and rarely correspond to the specifics of an individual farm or landowner's farming activity. Indeed, one site may be farmed by hundreds of farmers. Therefore conservation measures for Natura 2000 farmland need to be translated into farm level measures if there are significant variations within the site. Natura 2000 management plans can include legal requirements that apply to farmland and also guidance on voluntary land management activities. The voluntary land management may be supported by agri-environment payments, but farmers within a site may or may not choose to enter a voluntary agri-environment or similar contract, and even if they do the regional or national authority still bears ultimate legal responsibility for ensuring successful management of the Natura 2000 site.

[19] Sweden, UK, Cyprus, France and Portugal had more than half to all completed in 2010; Denmark, Czech Republic, Belgium, Romania and Ireland had more than half in preparation in 2010.

[20] Poland, Netherlands, Malta, Luxembourg, Italy, Hungary, Greece, Estonia, and Germany had less than half completed or in preparation in 2010; and six Member States did not report on progress.

4.2.2 Preventing degradation of farmland habitats within the Natura 2000 network

Under the Habitats Directive[21], Member States must assess projects on Natura sites that are not necessary for the management of the Natura features. Projects should then only be permitted if it has been ascertained by an appropriate assessment that there would be no adverse effect on the integrity of the site[22].

In some Member States, the relevant process for appropriate assessments is defined in the same way as for an EIA (see below) whilst in others it is defined in separate legislation. However, the effectiveness of appropriate assessments in protecting the habitats and species of European conservation concern from detrimental changes in agricultural management is not entirely clear. Farmers are generally not obliged to report incremental agricultural developments in a way that would trigger appropriate assessment, and the process has seldom been used to assess the impact of farming-related activities or developments, at least in some Member States (Court of Accounts of France, 2008). Only a few Member States have formally declared that Natura 2000 land owners, land users and other managers can be fined in cases of inappropriate management, or that ultimately land can be compulsorily acquired where appropriate management cannot be secured (Kruk *et al,* 2010). Conflicts between agricultural and nature conservation priorities are usually resolved in relation to the administrative processes of site designation and the establishment of management plans, where the outcomes can be uncertain for the reasons set out above (Bouwma *et al,* 2010).

4.3 Legislative protection of HNVF outside the Natura 2000 network

The majority of HNVF land lies outside the designated Natura 2000 areas where the protection afforded by the Directives applies primarily to habitat types and species of conservation concern listed in the Directive. Article 10 of the Directive, which applies to a certain extent to landscape features that improve the coherence and connectivity of the Natura 2000 network has not yet been vigorously implemented in the Member States (IEEP and Alterra 2010).

4.3.1 Protection of farmland habitats of conservation concern outside the Natura 2000 network

The more widespread habitat types, such as alpine and subalpine calcareous grasslands, and lowland hay meadows of conservation concern under agricultural management, have only half or less of their extent within Natura 2000 protected areas (ETC/BD, 2008b), although Member States are obliged to establish sufficient Natura 2000 sites to protect a representative proportion of the habitats and species in their territory for which they have a particular responsibility. These areas are not effectively protected by EU legislation, even though they are often crucial to achieving overall favourable conservation status.

[21] As defined in Habitats Directive Article 6.3 and 6.4, which also apply to the Birds Directive.

[22] Guidance document on the Assessment of Plans and Projects significantly affecting Natura 2000 sites (November 2001). Access at: http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm [last accessed 28 March 2014].

However, all Member States have protected areas of different kinds under national legislation, for example national parks and nature parks. The extent to which they promote protection for HNV areas is difficult to assess. Furthermore, some Member States (such as Slovakia) are taking action to integrate habitats of conservation concern outside Natura 2000 areas into their agricultural policies, to ensure that farmers are able to access funding opportunities (Olmeda *et al,* 2014). Some Member States are planning ecological networks outside Natura sites. Amongst examples that may provide benefits for HNV farmland once they are fully implemented are the Netherlands Ecological Network, the French *Trame verte et bleue*, and other smaller schemes (Mazza *et al,* 2012). The new EAFRD Natura 2000 measure is designed to encourage funding for 'stepping stone' habitats, and for green infrastructure, so this might encourage wider funding for HNV farming that maintains ecological networks.

In principle, the Environmental Impact Assessment (EIA) Directive provides a certain level of protection against agricultural activities that damage or destroy such habitats, such as restructuring of rural land holdings or conversion of land, but in practice projects generally fall below the thresholds applied by Member States for screening applications, and are not assessed (European Commission, 2009). The EIA procedures particularly fail to take into consideration the cumulative impacts of projects and plans.

The EU's EIA legislation requires Member States to act to minimise environmental damage from agricultural developments and other 'projects' in rural areas including the restructuring of agricultural land and conversion of uncultivated or semi-natural habitats to intensive agricultural management. If implemented well, this should provide a strong legal underpinning to complement land management options within Pillar 1 and Pillar 2 of the CAP (see below). However, a recent analysis by IEEP (Baldock et al, 2013) found that despite the fact that it is a legal requirement under the Directive to ensure that a register of all screening applications and subsequent decisions is available in the public domain, such information could not be found for most Member States. The only information that could be found outside the UK was for Ireland and Germany. Analysis of these Member States' EIA information indicated that the frameworks and criteria for screening of projects for restructuring or intensifying agricultural land is generally weak. Effectively this exempts most such projects and so the impact is not assessed (COWI, 2009).

4.3.2 Protection of species on HNV farmland through the Birds and Habitats Directives

The Directives include general measures to protect species and their habitats, including the protection of birds from intentional killing, injuring, or destroying or disturbing nests and eggs[23], rules about hunting and trapping[24], deliberately destroying or damaging other species[25] or introducing non-native species[26]. In addition, Article 12 of the Habitats Directive requires Member States to prohibit the deterioration or destruction of breeding sites or resting places of strictly protected animal species listed in Annex IV. Therefore some important features of HNV farmland should be protected because they provide breeding sites, foraging habitats or resting places for these strictly protected species. For example,

[23] As defined in Birds Directive Article 5.
[24] As defined in Birds Directive Articles 7 and 8.
[25] As defined in Habitats Directive Article 13 regarding plants, and Article 15 regarding other species.
[26] As defined in Habitats Directive Article 22b.

these could include old hedges, old trees, ponds and ditches as well as patches of rock, semi-natural grassland and shrubs. However, as with the protection of sites, the measures are qualified by the possibility for derogations, and as noted in Commission guidance[27], application of Article 12 measures to agricultural habitats is complex, because the majority of agricultural activities are not subject to prior approval or consent. Thus practical protection is probably constrained (as it is for appropriate assessments) by the limited regulation of agricultural operations and probably also by the limited awareness amongst land managers of the potential biodiversity impacts of their operations, and the legal consequences.

It is also important to bear in mind that measures taken by Member States to implement the Habitats Directive should always be proportionate and appropriate to the objective pursued, ie maintaining and restoring favourable conservation status. Thus it would be disproportionate to require all agricultural operations to be assessed with respect to potential impacts on strictly protected species, especially bearing in mind that this would affect all areas, not just Natura 2000 sites. Occasional accidental disturbance or killing of individuals as a result of activities that maintain the species habitats (eg pond management) may be acceptable where these do not harm populations as a whole. But the Commission guidance clearly states that '*Where however an on-going land use (due to changes of practices, intensification, etc.) is clearly damaging to a species, leading to decreases in its population in the area, a Member State is required to find ways to avoid this*' (European Commission, 2007).

According to the Commission, many Member States have developed and promoted guidance and codes of conduct to prevent impacts of agricultural activities on strictly protected species. But these should complement legal measures rather than replace them. Therefore, in addition to implementing SMR cross-compliance requirements (under which breaches of legislation can also lead to penalties applied to farmers' CAP payments), some Member States have chosen to include specific obligations relating to the protection of birds in their GAEC cross-compliance standards. For example, England's current (2007-13) cross-compliance regulations do not permit hedge trimming between March and 31 July (with some exceptions)[28]. The CAP Regulations for 2014-2020 includes a GAEC standard that bans hedge and tree cutting during the bird breeding and rearing season[29].

In general however, farmers' legal obligations regarding species protection are weakly defined and enforced in many Member States (European Court of Auditors, 2008). This is probably in part because some restrictions on farming operations are practically impossible to enforce if the infringements are unlikely to be revealed by infrequent routine spot checks. For example, farmers are expected to refrain from disturbing protected birds nesting on their land, such as the Corncrake (*Crex crex*).

[27] Guidance document on the strict protection of animal species. Access at: http://ec.europa.eu/environment/nature/conservation/species/guidance/index_en.htm [last accessed 28 March 2014].

[28] Defra (2014) The Guide to Cross Compliance in England 2014 complete edition. Access at: http://rpa.defra.gov.uk/rpa/index.nsf/0/6eb355ea8482ea61802573b1003d2469/$FILE/ATTUBLY9/The%20Guide%20to%20Cross%20Compliance%20in%20England%202014%20complete%20edition.pdf [last accessed 28 March 2014].

[29] Annex II of Regulation (EU) 1305/2013.

4.4 CAP cross-compliance requirements for HNV farmland

Farmers receiving area-based payments under the CAP must comply with cross-compliance standards defined by the Member State across the whole farm holding, or risk loss of part of their CAP payments, and possibly separate legal action if the non-compliance is a breach of national regulations. Cross-compliance has two elements:

- **Statutory Management Requirements (SMR)** resulting from national transposition of EU legislation in the areas of environment, public, animal and plant health, and animal welfare. For HNVF farmland, particularly Types 1 and 3, the most relevant requirements are those under the Habitats or Birds Directives (described above) although animal welfare requirements can have a significant impact on some HNVF pastoral systems.
- **Standards of Good Agricultural and Environmental Condition (GAEC)** defined by Member States within the common EU framework[30] of standards for soil management, landscape features, encroachment of unwanted vegetation and protection of permanent pastures. (The way in which changes to this framework from 2015 will affect HNVF land is discussed in section 4.6 and Chapter 11).

Additionally, recipients of EAFRD agri-environment payments are required to comply with farm level requirements on the use of fertilisers and plant protection products which Member States define in their RDPs[31] and other relevant mandatory requirements established in national or regional regulations.

The framework of GAEC standards for 2007-14 and the new framework for 2015-20 is shown in Table 4.1. The way in which Member States have defined the 2007-13 GAEC standards is discussed below and some of the impacts on HNVF farmers and farming systems are then assessed. It is important to recognise that the effectiveness of GAEC cross-compliance at farm-level depends on the farmer's perception of the cost-benefit **relationship** between the costs of implementing the GAEC requirements on the farm concerned and the total CAP payments received. If costs are perceived to be too onerous, the farmer may simply decide to take the risk of being penalised for non-compliance.

Table 4.1: Framework of issues and standards for GAEC cross-compliance until 2014 and from 2015

Issue	2007-2014		2015-2020
	Compulsory standards	Optional standards	Requirements and standards
Soil	Minimum soil cover	Retain terraces	Minimum soil cover
	Minimum land management reflecting site-specific conditions		Minimum land management reflecting site specific conditions to limit erosion
	Arable stubble management	Standards for crop rotations	Maintenance of soil organic matter level through appropriate practices including ban on burning arable stubble, except for plant health reasons (1)
		Appropriate machinery use (maintain soil structure)	

[30] Regulation EC 73/2009, Annex III applies to the framework for GAEC 2007-15

[31] As required by Article 39(3) of Regulation 1698/2005

Landscape	Retention of landscape features, including, where appropriate, hedges, ponds, ditches trees in line, in group or isolated and field margins	Minimum livestock stocking rates or/and appropriate regimes	Retention of landscape features, including where appropriate, hedges, ponds, ditches, trees in line, in group or isolated, field margins and terraces, and including a ban on cutting hedges and trees during the bird breeding and rearing season and, as an option, measures for avoiding invasive plant species.
		Establishment and/or retention of habitats	
	Avoiding the encroachment of unwanted vegetation on agricultural land	Prohibition of the grubbing up of olive trees	
	Protection of permanent pastures	Maintenance of olive groves and vines in good vegetative condition	Protection of permanent pastures in 2015 and 2016
Water	Establishment of buffer strips along water courses		Establishment of buffer strips along water courses (2)
	Where use of water for irrigation is subject to authorisation, compliance with authorisation procedures		Where use of water for irrigation is subject to authorisation, compliance with authorisation procedures
			Protection of ground water against pollution: prohibition of direct discharge into groundwater and measures to prevent indirect pollution of groundwater through discharge on the ground and percolation through the soil of dangerous substances, as listed in the Annex to Directive 80/68/EEC in its version in force on the last day of its validity, as far as it relates to agricultural activity

Notes: (1) The requirement can be limited to a general ban on burning arable stubble, but a Member State may decide to prescribe further requirements. (2) The GAEC buffer strips must respect, both within and outside NVZ, at least the requirements relating to the conditions for land application of fertiliser near watercourses.

Source: Compiled using Regulation (EC) No 73/2009, Annex III and Regulation (EU) No 1306/2013, Annex II.

4.5 GAEC standards and HNV farming systems

The Member State case studies have shown that most countries currently define generic GAEC standards that do not differentiate between the HNV land and other farmland; there is no obligation to make such a distinction. However, it is also clear that there are situations where generic GAEC standards can have a very different effect (positive or negative) on HNV land compared to the effect on most other land.

4.5.1 Examples of GAEC standards specific to HNV farmland

The case studies examined whether there are GAEC standards that apply to HNV land specifically and would rarely if ever apply to other land on the farm. Only a few examples were found. In the UK and Ireland restrictions on the burning of heathland (Scotland) and management of pastures on common land (Ireland)[32] have been defined in the form of compliance with pre-existing national regulations, for example. Although not explicitly

[32] These are requirements within Ireland's 'Commonage framework plans'.

referring to HNV farmland, these are in effect specific to HNV farmland since the vast majority of common land in Ireland and heathland in Scotland is part of HNV pastoral livestock systems. In Estonia, the GAEC standard for permanent pasture specifies three different dates for annual mowing of grassland, applying generally to semi-natural habitats and to pastures in nature protection areas. Much of the HNV farmland is within these categories. In the UK GAEC standards have been used to reinforce the implementation of EIA requirements for protection of semi-natural grasslands.

An interesting, albeit out-dated, example of a GAEC condition specifically defined only for HNV farmland is an earlier provision in Bulgaria. In 2008 the authorities introduced a condition that eased the otherwise stringent tree cover rule that had been defined in Bulgaria under the GAEC standard for protection of permanent pastures. This change was made specifically to allow farmers of HNV pastures with up to 25 per cent tree cover to apply for the agri-environment scheme for 'traditional livestock systems – mountain pastoralism'[33]. Rather unusually, these farmers were still excluded from SAPS support at the time as the less restrictive GAEC applied only to agri-environment payments. In 2010, this GAEC condition was extended to include an HNV agri-environment scheme for 'restoration and maintenance of HNV grasslands'. This HNV-specific GAEC condition has since been removed and is now incorporated in the eligibility rules for HNV agri-environment schemes for pastoral land[34].

The fact that the majority of GAEC standards are not designed specifically for local conditions of HNV farming, and do not differentiate according to the type of habitat or the environmental value of the farming system, is explicitly noted as a concern in the case studies for Italy and France. Other specific examples of generic GAECs in other Member States are discussed below in section 4.5.2.

4.5.2 Examples of GAEC standards that contribute to maintaining HNV farmland

A number of the GAEC standards that apply to the whole agricultural area, including HNV farmland, have been noted as being beneficial for HNV farming systems in general. One example is the requirement for minimum stocking density and late mowing under the standards on 'protection of permanent pasture' and 'minimum land management reflecting site-specific conditions'. Several case studies highlight that minimum stocking limits are generally useful for keeping HNV land and habitats from the damaging effects of gradual under-utilisation. The Slovakia case study underlines the benefits of the requirement for late mowing for HNV farmland. In most situations it is clear that the minimum grazing and mowing requirements should deliver potential benefits, provided the CAP payment is sufficient incentive to maintain the activity, but it is less clear whether these benefits are significantly higher for HNV farmland than for any other land. Similar comments have been

[33] The condition ran as follows: 'For lands (grassland) with HNV or in the scope of ecological network Natura 2000 and protected areas, depending from the real condition of the meadow or grassland is allowed to be left mosaic located single or group of trees or bushes or boundary strips up to 25% of the whole grassland area' (Bulgaria case study).

[34] These rules allow support to scrub and grasslands that comply with the following requirements: i) more than 100 square meters of the agricultural parcel claimed area falls in the HNVF layer; ii) not more than 25% of the parcel is covered by mosaic situated scrubs, trees, and other non-eligible areas with single area less than 100 square meters.

made about the standard for the 'maintenance of landscape features'. It should be noted that in several Member States these three standards also have some requirements that are unhelpful for HNV farmland, as discussed in section 4.5.3[35].

In southern Europe, GAEC standards on retaining terraces (in Spain, Cyprus, Italy and Slovenia), minimum maintenance of olive groves and vineyards (in Italy and Slovenia) and a ban on grubbing up olive trees (in Cyprus, Italy and Portugal) are considered to benefit HNV farmland since they affect widely used extensive grazing systems, important HNV habitats and traditional HNV farmland features. However certain issues arise with the cost of compliance, particularly with the requirement to retain terraces. The Italian case study notes that such costs 'could be greater than the Single Farm Payment' in some conditions and could thus lead 'to a risk of land abandonment, particularly in marginal areas' unless the farmers receive support via RDP agri-environment schemes and non-productive investment grants, or through local measures. The case study for Spain also comments on the costs of retaining terraces, and notes that in practice this GAEC requirement does not seem to be widely enforced. This is likely to be true in other Member States as well.

The use of crop rotations, in cereal systems in particular, is noted as particularly beneficial in Cyprus and Slovenia. The Slovenian case study notes that this requirement helps to maintain the mosaic character of HNV land.

The effect on HNV pastures of the GAEC standard for preventing the 'encroachment of unwanted vegetation' depends very much on the way in which Member States define 'unwanted', as well as on local conditions. In several Member States there are generic obligations to remove specific weeds and invasive species (eg *Ambrosia artemisiifolia, Robinia pseudo-acacia, Ailanthus altissima, Heracleum mantegazzium*); experts in Hungary and Czech Republic consider these obligations as increasingly beneficial to HNV farmland. Where the standard is aimed at scrub encroachment on agricultural land generally, the effect can be very different. For example the Finland case study observes that this standard has a 'very weak connection' to the needs of HNV farmland; and several other case studies underline problems caused by this type of obligation, discussed below.

4.5.3 Examples of GAEC standards that are unhelpful for maintaining HNV farmland

Evidence collected in case studies also demonstrates that there is a range of issues about the impact on HNV farmland of generic GAEC standards that apply to farmland generally, and the way these are administered. A particular point of concern is with the requirements for management of pastures defined under GAEC standards for the 'protection of permanent pasture' and 'minimum land management reflecting site-specific conditions'. In France, Italy and Slovakia, the case studies expressly note that the maximum stocking densities are set too high, above the level that could protect HNV farmland from overgrazing; and that the limits on maximum fertiliser use are too generous to avoid intensification of semi-natural grasslands. Implementation of Estonian requirements on minimum grazing and late mowing is unhelpful in grassland areas flooded during bad weather when this makes it impossible for farmers on HNV farms to carry out the usual

[35] For France, the case study notes that the standard on the 'maintenance of landscape features' has limited or no relevance since the requirement is to include 4% of farmland under such types of features, while the majority of HNV farms have a much higher share of land under such features.

basic management, and as a consequence their agri-environment payments are withdrawn[36].

The GAEC requirement for 'minimum land management' is defined by many Member States as simply the mechanical clearance of vegetation, whether by ploughing in Spain or 'mulching' (mowing but not removing cuttings) in many central European countries. Although this may be appropriate for intensively farmed land, ploughing HNV pastureland that has previously been managed by grazing will seriously damage the habitat, and mulching reduces both plant and invertebrate diversity. Not only the HNVF farming system and the livestock but also the HNV habitats, mosaic structure and species will disappear completely within a few years to be replaced by an annual pass with the tractor. For example, a prescription in Germany's annual mulching requirement for pastures is also considered to be suboptimal[37] since 'it would be better to keep vegetation structure over winter rather than to have all HNV farmland mulched in autumn'. In Latvia, the late mowing requirement is incompatible with the needs of vegetation management in HNV grassland habitats; the current mowing date was originally set late to protect birds from cutting machinery but recent findings conclude that it threatens the future of semi-natural grassland habitats.

As already noted, requirements on 'avoiding scrub encroachment', intended to protect agricultural land from abandonment can have a perverse and damaging effect on important HNVF pastures in several Member States. While being helpful elsewhere, in Latvia the GAEC standards are defined in a way that excludes all wooded pasture systems and also fails to protect landscape elements in open areas[38]. To prevent the spread of bulrush, Latvia sets a maximum period for flooding of wet grasslands with the occasional consequence, in rainy summers in particular, that HNV farmers lost payments due to GAEC non-compliance[39]. In Cyprus the expert commented that the requirements for this GAEC standard encouraged drastic (chemical) control of ill-defined 'unwanted vegetation' which led to the 'scouring' of scrub from many fields in HNV areas.

In addition, there are a few cases of GAEC standards that may have generally positive effect but include caveats which have unintended negative effects on HNV farmland. Examples are the caveats in the GAEC requirements for 'minimum land management' in Spain which allow tillage and burning as an alternative to maintaining a minimum livestock density, so that the GAEC rules allow HNV farming to be abandoned and replaced by mechanical clearance of

[36] In 2012 around 4,000 ha of farmland (out of ~26,000 ha of total area under agri-environment contracts for management of semi-natural habitats in Natura 2000) did not receive agri-environment support because of bad weather made it impossible for farmers to comply with the required management. The justification for withholding the agri-environment payments was that 'if no management takes place there´s no 'additional cost' either'.

[37] The mulching requirement is part of the GAEC standard on minimum maintenance, together with the minimum mowing obligation.

[38] The rule allows no more than 50 separately growing trees on 1ha, as well as no tree or shrub clumps covering more than 0.01 hectares.

[39] The current requirement is that there is 'not wetland covered with water for more than four consecutive weeks in the period from 15 of May to 15 of September'. The requirement has a lesser impact than the more stringent rule implemented until 2012, under which 'many wet grasslands were excluded from the areas eligible for payments'.

vegetation; and a get-out clause for the requirement on the grubbing up of olive trees in Cyprus.

In Latvia an alternative option of mulching and leaving grass (instead of removing it for hay) has created a disincentive for HNV grassland management. The Latvian case study cites a survey showing that 40 per cent of farmers enrolled in a relevant agri-environment scheme chose to avoid hay making or grazing, and instead used the GAEC caveat that allows mulching the grass. The caveat originally was introduced to enable farmers to carry out basic management if they could not undertake full-time farming, and was seen as an ecologically better option than the natural succession with woody species. Since the effect of leaving mulched grass on semi-natural grassland is comparable to excessive fertilisation, this is not an acceptable method of HNV management in the long term.

4.6 Conclusions on EU legislative support for HNVF

Some Member States have made considerable progress in preparing Natura 2000 management plans and using agricultural support policies to encourage farmers to manage HNVF land within and outside Natura 2000 sites. Nevertheless the conservation status of those habitats and species of European concern that are dependent on agricultural management continues to decline.

The EU environmental legislation considered here should in principle afford a considerable degree of protection for HNV farmland habitats and species of conservation concern (defined in the Directives) from deliberate damage or destruction, particularly within Natura 2000 sites. In practice the actual level of protection varies and is often weak because of the way in which the Directives have been transposed or legislation enforced. However, it is important to recognise that regulatory measures on their own are not an effective means of improving HNVF land management or restoring habitats, and that support measures are likely to be the policy tool most useful for this purpose.

The way in which Member States have defined GAEC standards within the current framework varies but generally has not been focused on the particular needs of HNVF farming systems, land or management practices. Of particular concern is the damaging effect on HNVF pastoral land of reliance on GAEC standards that require only annual mechanical maintenance, which if pursued usually would lead to loss of both the HNVF farming and the biodiversity associated with it. Clearly measures to maintain the viability of grazing rather than to regulate it via cross compliance are important in this case.

From 2015 there will be a new GAEC framework, shown in Table 4.1. The landscape maintenance standard for removal of ‘unwanted’ vegetation has been redefined to make clear that this refers to invasive species (and is optional). Other standards that have been removed from the GAEC framework will, from 2015, fall within the scope of the new greening payment requirements (crop diversification, protection of permanent grassland) or the framework for defining ‘agricultural activity’ for eligibility for direct payments.

5 Influence of SPS, SAPS and LFA payments on HNV farm incomes

Key findings

- **The inherently low productivity of HNV farmland and typically labour intensive farming practices on which the biodiversity depends put HNV farms at a disadvantage in competitive markets. This means that they are often dependent on CAP support to maintain farm incomes, but farm level reporting on CAP payments does not distinguish between HNVF and other farmland, and therefore cannot reveal what proportion of the total CAP direct payments, agri-environment and LFA compensation payments are going to HNV farms.**

- **The case studies reveal that HNVF incomes generally are lower than on other farms, for example in Italy where a typical HNV farm manages twice as much land as a non-HNV farm but has only a quarter of the value added per hectare. CAP support is generally much lower for HNV farms than other farms, particularly in some regions with large areas of HNVF where the historic SPS system is applied, including Spain and the UK.**

- **Hill livestock farms in the United Kingdom rely on SPS and LFA payments to offset losses from their low-intensity HNV systems. For farmers in North West Scotland, the total of all their CAP payments (which are much lower on a per hectare basis than those in more productive regions of the country) is not even sufficient to offset the losses from their HNV suckler cow systems which are maintaining important HNVF habitats.**

- **Some HNVF land of critical importance for biodiversity was partially or completely excluded from CAP support in 2007-13. In some Member States with large areas of land under HNVF systems a significant proportion of HNVF land and farmers do not receive CAP support payments. This includes threatened habitats dependent on agricultural management that Member States have a duty under the Habitats Directive to maintain in or restore to 'favourable conservation status'.**

- **The reasons for these failures to provide CAP support include HNV farmed land defined as 'non-agricultural' or 'ineligible'; insufficient allocation of SPS rights in relation to the area of land actually used by farmers; the presence of 'too many' trees and rocks in semi-natural pastures; and the small size of some HNV farms and parcels.**

- **The 2013 CAP reform legislation offers Member States opportunities to revise their CAP eligibility criteria for semi-natural pastures, trees and landscape features, minimum farm and parcel sizes and to allocate payment entitlements in a way that gives HNVF land and farmers much better access to CAP income support payments.**

- **It is unclear if and how Member States will choose to use these options (which could have consequential impacts on payments to other farmers and the workload of paying agencies). In some Member States there is unwillingness to include land in the new payment system that was not receiving payments under the pre-2014 CAP, even if such land has been in farming use for many years.**

This chapter discusses widely available CAP support payments that are intended to support the economic viability of farming as a rural land use in all Member States. These are principally the farm income support payments SPS and SAPS wholly funded by the CAP Pillar 1, and the LFA payments under the 2007-13 RDPs co-financed by EAFRD[40]. Technically LFA

[40] Although for the 2007-13 period this measure was described in EC Regulation 1698/2005 Article 37 as 'natural handicap payments in mountain areas and payments in other areas with handicaps' the more familiar term LFA is used here.

payments are not income support payments but compensation for the 'handicap for agricultural production' in mountain areas and other areas facing specific handicaps. There is no obligation on Member States to implement this measure, but most do. Because farms that meet the eligibility criteria within a designated LFA area receive a payment without further obligations, for these farmers the LFA payments effectively provides a top up to their SAPS or SPS income support payments.

The chapter is in three sections. The ineligibility of some of HNVF land and farms for SPS and SAPS payments is reviewed first, using information provided by the case studies (section 5.1); this is followed by a discussion of the significance of SPS and LFA payments for the economic viability of HNVF farming systems (section 5.2), illustrated by a detailed example of how these payments affect an HNVF farmer's choices about future land management on an HNV livestock farm in North West Highlands of Scotland.

5.1 Ineligibility of some HNV land and farmers for CAP income support payments

CAP Pillar 1 SPS and SAPS payments are the mainstay of the CAP and represented 62 per cent of the total CAP budget in 2012. It might be assumed that, like the vast majority of EU farmland, all HNVF land in agricultural use would be eligible for these basic payments, but this is not the case in a few Member States notably Bulgaria, Romania and parts of the Baltic Member States and Sweden. Of particular concern are the large HNV areas of semi-natural habitats used for grazing which are not eligible for the basic CAP payments that are available on more intensively farmed land. The ineligible land including many Annex 1 habitats wholly dependent on appropriate grazing management, for example heathland, dunes and fens in Latvia, *phrygana* scrub and pseudo-steppe grazed by sheep and goats in Cyprus, and semi-natural grasslands in Sweden.

There are a many reasons for HNV land and farmers being ineligible for CAP Pillar 1 payments, but most relate to the ways in which Managing Authorities have chosen to interpret the CAP legislation and Commission guidance. One particular problem is the definition of eligible land-cover on semi-natural pastureland, because some Member States have taken a more restrictive approach than others in defining eligible land and GAEC standards. For example, the focus of the Regulation on defining permanent pasture as 'herbaceous'[41] appears to have been one of the factors leading the Managing Authority in Bulgaria to think that direct payments were intended primarily intended for more productive pastures (Beaufoy *et al*, 2011). Box 5.1 illustrates selected examples from the Member State case studies of HNVF land in agricultural management that does not receive support under Pillar 1 in the 2007-13 period. Some common themes emerge, including:

- the exclusion of pastureland with more than 50 trees per hectare; although the Regulation is relatively unambiguous (land is eligible if agricultural production can be carried out in a similar way as on parcels without trees in the same area) the situation was complicated by the Commission's 'clarification'[42] that land with more than 50 trees per hectare should not be considered as eligible although exceptions could be made for environmental reasons. Some Member States have been more flexible than others in applying this rule, for example Spain, the United Kingdom and France;

[41] EC Regulation 1120/2009 Article 2.
[42] Working document AGRI/60363/2005.

- the current GAEC standard for minimum land management and avoidance of unwanted vegetation is implemented by the Member State in a way that excludes pastureland with naturally occurring shrubs, rocks and other features;
- there are HNV landscape features which are not recorded as such in IACS making them ineligible for payments;
- some common grazing land has not been registered as agricultural land in LPIS (for example in Cyprus), or in the case of Bulgaria *has* been registered but is deemed 'ineligible' by the Managing Authority;
- land is deemed ineligible because it only available for seasonal use (for example where landless farmers graze cereal stubble owned by other farmers, or land is seasonally flooded and inaccessible to livestock);
- the minimum holding and parcel size defined by the Member State excludes very small HNV farms, for example in Romania; and,
- certain habitats are not considered to be agricultural land, including some Annex 1 habitats dependent on livestock grazing.

As a result large numbers of HNVF farmers are simply not recognised by the Member State's agricultural support systems and are economically disadvantaged compared to farmers of more intensively managed land. In some cases the ineligibility of semi-natural pastureland for CAP payments not only disadvantages the farmers concerned but actually increases the risk of HNVF abandonment. The European Court of Auditors (2011) pointed out that 'in some Member States marginal land and wooded areas traditionally used for occasional grazing are accepted as being eligible while, in other Member States, such land is excluded from SPS aid. Such marginal land can quickly become overgrown with shrubs and forest, making it unsuitable for agricultural purposes'.

Box 5.1: Examples of HNV farmland defined by Member States as ineligible for CAP support payments

Romania: 72 per cent of holdings and over 20 per cent of Romania's UAA (much of it HNV) are not eligible for CAP payments. These include holdings under one hectare and areas with more than 50 trees or large rocks per hectare. The government does not have data on what proportion of the farmland is ineligible within the communes targeted for the HNV agri-environment support[43].

Bulgaria: although all agricultural land in Bulgaria is registered in LPIS, this includes a layer of 'ineligible land'. In practice, the four land uses that are most likely to have large areas of HNV farmland also represent the highest share of this layer that is ineligible for CAP support. Whereas 96 per cent of arable land is eligible for CAP support, the corresponding figure for permanent crops (of which a large proportion is likely to be traditional orchards) is 53 per cent, for pastures, commons (*meri*) and meadows it is 43 per cent, and for 'family gardens' less than nine per cent.

Slovakia: more than 113,000 hectares of HNV farmland is not registered in LPIS, much of it semi-natural grassland, which may be partially abandoned, but still has high biodiversity value.

Cyprus: large areas of pseudo-steppe, *phrygana* or scrub used for free-range grazing with goats and sheep are not registered in LPIS and IACS, principally because they are 'common' land, and consequently are not eligible for CAP support in Cyprus. On a smaller-scale, in cropped (as opposed to grazed) areas, remnants of natural vegetation within the farm are recorded in the paying agency's mapping system, but are not identified as landscape features eligible for CAP payments, which generates a disincentive for protection of these areas at a farm level.

Estonia: if an area of semi-natural habitat is recorded in LPIS as agricultural land eligible for support, the

[43] These are communes where land use records show more than 50 per cent of the UAA in the commune is registered as permanent grassland.

farmer can choose to apply *either* for specific agri-environment semi-natural habitat support (and no other CAP per hectare support) *or* for all other hectare based CAP supports (eg SAPS, Natura 2000 compensation on agricultural land, organic farming support) Increasingly farmers are choosing the latter option, which means that they do not have to verify their application with Environmental Board nor participate in compulsory training (both are requirements of the agri-environment semi-natural habitat support).

Estonia: valuable semi-natural habitats with trees were initially excluded from the definition of CAP permanent grassland eligible for SAPS but, as a result of court cases and widespread political concern, a series of adjustments were made in 2007-2008. In the four westernmost counties wooded pastures and wooded meadows which have >50 stems/ha but <50% canopy cover and were registered in 2004 are now considered permanent grasslands from a CAP perspective. However this redefinition has not been applied to other valuable wooded meadows and pastures elsewhere in Estonia.

Latvia: HNV farmland areas that are shrubby, wooded, wet or flooded in spring are often excluded from CAP payments because they are judged not to comply with Latvian GAEC standards (even if they are managed) or, as with heathlands, dunes and fens, are excluded because they are not considered by the Managing Authority to be 'agricultural' land in the sense defined by the legislation.

Sweden: there is a clear conflict between the permanent grassland definition within the current CAP direct payments legislation[44], and the intention of the Habitats Directive. An update of the LPIS after Sweden had amended the implementation of the CAP permanent grassland definition shows that 18 per cent of the land no longer eligible for CAP support (both Pillars) consisted of Annex 1 habitat types requiring agricultural maintenance (Jordbruksverket 2012).

Finland: most of the HNV farmland is currently registered on LPIS and IACS as farmland eligible for CAP support, with the exception of wooded pastures and grazed forests managed by Forest Service Board which are not regarded as 'farmland' because there are more than 50 trees/ha.

The Netherlands: 16 per cent of the HNV farmland does not receive CAP payments, compared to only 10 per cent of all agricultural plots in The Netherlands.

5.2 SPS and LFA payments and the economic viability of HNV farming systems

Chapter 2 discussed how farms differ in terms of the significance of HNVF land management within the farm business. This showed that the whole farm may be run under a low-intensity HNV farming system, often as part of a landscape of similar farms, with all production coming from the HNVF system; whereas at the other extreme the farm may have only remnants of HNVF land which are still managed but make an insignificant contribution to the main farm business of intensive crop or livestock production on non-HNV land. In between are many partial HNV farming systems where HNV land is a functional part of a production system that also relies on more intensively farmed land.

The significance of HNVF within the farming system not only affects the overall biodiversity value of the farm or landscape, but has a profound effect on farm business income. HNV whole or partial farming systems are characterised by low external inputs per hectare and commensurately low productivity. The more the farm business relies on an HNVF farming system the lower the per hectare income of the whole farm will be, compared to non-HNVF farms producing similar products. Furthermore, HNV farming practices are often labour intensive. A comparative analysis of HNV and non-HNV farms in Italy, using FADN data for 2003-05, revealed that the labour productivity of HNV farms is on average 33 per cent lower than non-HNV farms and the return on investment is also lower (Trisorio and Borlizzi, 2011).

[44] EC Regulation 1120/2009 Article 2.

Table 5.1 illustrates the comparative structural and economic weakness of these Italian HNV farms.

Table 5.1: Structural and economic profile of HNV and non-HNV farms in Italy

	HNV farms	non-HNV farms	all farms
Utilised Agricultural Area ha	28.1	13.2	15.0
Net Value Added (NVA) €	15,966	28,629	27,029
Annual Working Unit AWU	1.0	1.4	1.4
Net Value Added per ha €	568	2,177	1,797
Net Value Added per AWU €	15,299	20,388	19,893
Net Farm Income (NFI) €	11,775	21,014	19,846
Total Assets (TA) €	301,193	352,918	346,380
Return on Investment (NFI / TA)	3.9	6.0	5.7
Family AWU (< 45 years old)	0.2	0.3	0.3
Farmer age	57.3	56.6	56.6

Source: Trisorio and Borlizzi, 2011, based on RICA-FADN (2003-2005)

HNV farms are more dependent on CAP payments than non-HNV farms (Osterburg *et al*, 2008, Trisorio and Borlizzi, 2011, Barnes *et al*, 2011). Using data for 2003 CAP direct payments[45] Osterburg *et al* (2008) shows that CAP payments[46] contributed at least 45 per cent of net farm income on EU-15 HNV farms generally, but in France, Germany and the UK these CAP payments were 100 per cent or more of net farm income.

More recent data confirm the dependence of grazing livestock farms in general, and LFA farms in particular, on CAP payments. Under the current system of CAP direct payments, 15 per cent of *all* grazing livestock farms would have a negative farm income in the absence of CAP direct payments[47] and be likely to discontinue production in the long run; Germany, Hungary, the Netherlands, Ireland, Slovakia Sweden and the UK have relatively high proportions of such farms (Vrolijk *et al*, 2010), and it is reasonable to assume that many of these will be wholly or partially HNV systems. In the UK, on English farms as a whole, CAP payments contribute on average 19 per cent of farm business income, but on LFA grazing livestock farms in England (many but not all of which will be at least partially HNVF) the CAP contribution is 146 per cent of farm business income (Defra, 2013) and on LFA hill sheep farms in in Wales it is between 166 per cent and 189 per cent. The largest CAP contribution comes from SPS and LFA payments as shown in Table 5.2, but these figures are likely to underestimate the role of CAP support for HNV farms because the sample will include some non-HNV farms. In Scotland the dependence of HNVF hill farms on SPS and LFA support is even higher, as the analysis in section 5.3 shows.

[45] These are coupled payments in one of the 2000-02 reference years that were directly translated into 'historic' SPS payments on most EU-15 farms.

[46] Comprising direct Pillar 1 payments coupled to crops and livestock, other subsidies, LFA and agri-environment payments

[47] Pillar 1 decoupled SPS and SAPS payments and coupled payments on crops, livestock and animal products.

Table 5.2: Dependence of hill sheep farms in Wales on SPS and LFA payments

		Small (< 28ESU)	Medium (28-60 ESU)	Large (>60 ESU)
Livestock (head)	Cows	8	19	36
	Other cattle	16	37	84
	Breeding ewes	504	1020	2288
	Other Sheep	310	566	1198
Land (ha)	Crops	0.3	0.9	3.3
	Hay	2.3	2.2	4.7
	Silage	10.3	18.2	35.7
	Other grassland	50.1	101	207
	Rough Grazing	40	63	208
	Other Common Land (share)	16	21	48
Income (€/farm[48])	SPS	€ 21,230.50	€ 39,997.49	€ 88,844.06
	LFA	€ 11,122.11	€ 14,952.70	€ 36,565.38
	Other	€ 3,123.86	€ 3,978.45	€ 10,597.08
Farm Business Income (€/farm)		€ 17,660.55	€ 33,174.61	€ 66,458.24
Subsidy payment as % of Farm Business Income		**186**	**166**	**189**

Source: Barnes *et al* (2011) based on Farm Business Survey data for Wales 2008-09)

5.3 Economics of HNV livestock systems in the North West Highlands of Scotland

This section examines in detail the economics of an HNVF livestock farming system on hill land in Scotland, to illustrate how the implementation of SPS and LFA payments in this part of the United Kingdom affects the future land management choices available to an HNVF farmer. This example was chosen because Scotland has a high proportion of semi-natural grazing land.

Scotland has at least 3.1 million hectares of farmed semi-natural pastures managed under low-intensity livestock systems, almost 75 per cent of all the agricultural land. These pastures are dominated by wet and dry acid grasslands, wet and dry heaths and blanket bog, but include also a diverse range of other less common habitats. Almost all of this land also lies within the Severely Disadvantaged Area of the LFA, and much of it is within the parts of Scotland defined as 'fragile' of 'very fragile' in terms of distance from markets and land disadvantage (as shown in the maps in Figure 8.1).

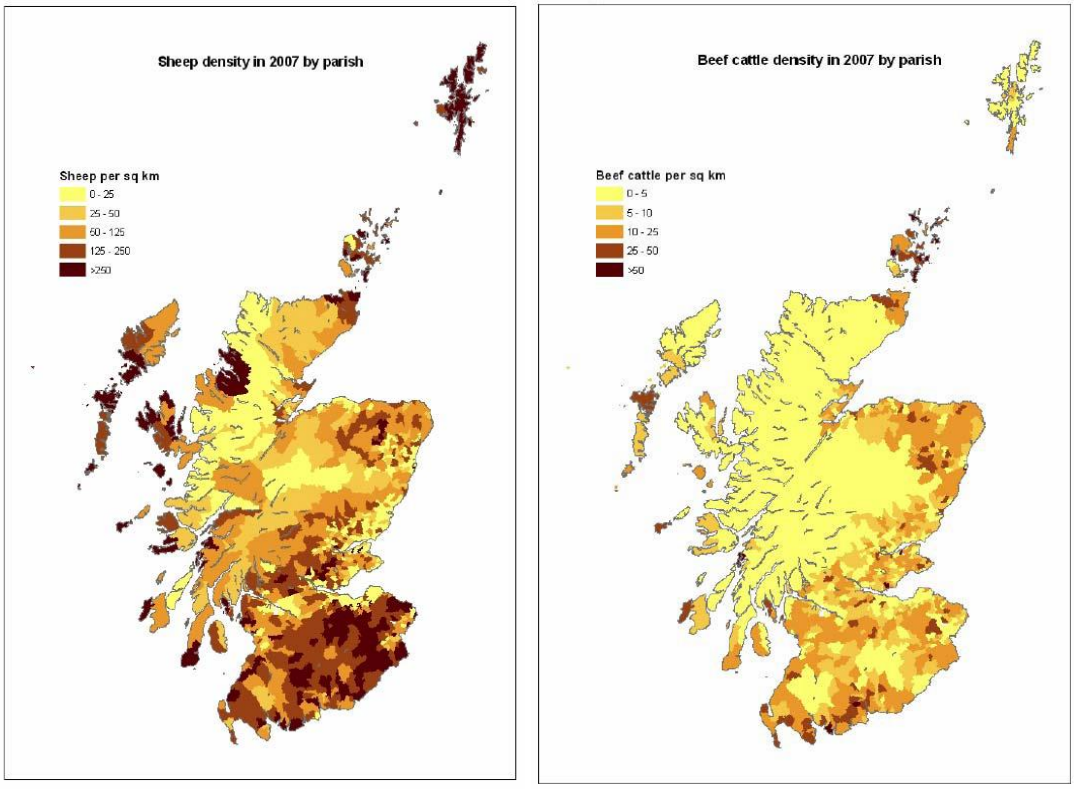
If Scotland has the most extreme and difficult farming conditions in the UK, the North West Highlands have some of the worst conditions in Scotland. The land is either very steep or very boggy; climate deteriorates rapidly with altitude; in many areas the precipitation reaches over 3,000 mm per year and although temperatures are moderate throughout the year, there are many days of gales and driving rain which, combined with the wet ground underfoot, makes for extremely testing conditions for livestock. To the inherent difficulties must be added the costs of location – distances to market are long, local markets extremely

[48] CAP payments and other farm business data for the United Kingdom in this report have been converted to € using the conversion rate of 0.79805 which applies to SPS payments in the United Kingdom in 2013).

small; the cost of bought-in inputs is commensurately high. Population density is generally low, so that maintaining the critical mass needed to justify services is always a challenge.

Soils are generally of limited productivity, the growing season is limited by climatic and edaphic factors and the area of better land where winter fodder can be grown is generally small. The systems that predominate therefore focus on producing store lambs and calves for sale to farms on better land for fattening or as breeding stock. Stocking densities are generally below 0.3 LU/ha, and Figure 5.1 illustrates the very low densities in the North West, particularly of beef cattle.

Figure 5.1: Density of sheep and beef cattle in Scotland in 2007 (head per hectare)



Source: http://www.scotland.gov.uk/Publications/2008/06/11151041/3 [last accessed 28 March 2014]

There are more sheep than cattle in Scotland's LFA as a whole, over 2.3 million breeding ewes and 0.3 million suckler cows[49]. The sheep are predominantly native hardy breeds – the Scottish Blackface on the poorest land and the Cheviot on slightly better areas. These are kept in hefted flocks (territorial in behaviour, without the need for constant close shepherding) and often remain on the same land all year. Cattle are usually, although not always, wintered indoors; herds usually consist of a variety of cross-bred animals with a varying proportion of native (especially Shorthorn, but also Highland, Galloway, Shetland etc.) and continental blood (Limousin, but also Charolais, etc).

Declines in livestock keeping have been set out by the Scottish Agricultural College in two reports for the Scottish Government (SAC, 2008 and Thomson, 2011) and other work has

[49] http://www.scotland.gov.uk/Publications/2013/06/5219/10#c9 [last accessed 28 March 2014]

looked into the possible environmental impact of declines in livestock keeping on semi-natural pastures (Silcock *et al*, 2012).

The example below illustrates in detail the economic performance of a cattle system and a sheep system typical of farming in North West Scotland.

5.3.1 Farm Business Income from the HNV hill suckler cow and hill sheep systems

The farm business data used here is taken from the latest of an annual series of reports on the economics of sheep and cattle enterprises in Scotland (QMS, 2013). In the QMS data cattle systems seem more economically viable, but it must be borne in mind that sheep systems cover a wider spectrum of land capabilities, and when a cattle system and a sheep system are compared *under the same conditions* in North West Scotland the sheep system is more economically viable, which means that sheep systems are the 'farming of last resort'. The presence of cattle *may* reflect tradition, but in general also indicates that the farmer has a slightly better set of agricultural resources at his/her disposal. The income from the HNV production system and from decoupled CAP payments is estimated separately below, followed by a short discussion of the choices facing the farmer.

Farm Business Income represents the financial return for unpaid labour of the farmer and family workers and the return (assumed here and by QMS (2013) to be five per cent) on their capital invested in the farm business, including livestock, land and buildings.

The data used come from the farms with the 'lower third' of performance in the overall set of hill suckler cow and hill sheep enterprises, because the reported characteristics of herds and flocks in these subsets correspond most closely to those found in the North West Highlands of Scotland.

A farm of 716 hectares with 100 breeding cows would expect to rear 85 calves per year, but 18 of the heifer (female) calves would be kept as herd replacements, leaving 67 calves for sale. The total costs of production are calculated by QMS (2013) at €4.37/kg live weight sold off the farm[50], but the calves sold for only €2.54 per kg live weight, a loss of €1.83 per kg. Thus the farm business is making a loss of €690 per calf sold[51] or €65 per hectare from this HNV farming system. A similar calculation, using QMS (2013) data for a hill sheep system on this type of land shows that this makes a somewhat smaller loss of €50 per hectare.

[50] These costs per kg are made up of: variable costs €1.49, fixed costs €1.38, labour €0.70, return (of 5%) on capital in land and buildings €0.39, return (of 5%) on working capital (in livestock) €0.24, labour €0.70 and replacement heifers €0.18.

[51] The average liveweight of a calf is given as 377 kg.

Suckler cows on a typical moorland common pasture in Skye. Grazing on the hill takes place from May/June to October/November; cattle are usually housed during the worst of the winter weather.(Image: Richard Dorrell, Creative Commons Licence)

5.3.2 Farm income from CAP payments

These HNV farms are eligible for SPS income support payments and LFA payments. The suckler cow system is also eligible for the Article 68 Scottish Beef Calf Scheme (coupled Pillar 1 payment). Agri-environment payments in Scotland are potentially available through two schemes, Land Managers' Options (LMO) for which all farmers can apply, or the selective Rural Priorities (RP) scheme. Income from agri-environment payments is not included in the farm income calculations below for a number of reasons:

- there is no 'average' level of participation in the widely available LMO, and in practice this scheme offers few agri-environment options that are relevant to the North West Highlands. On the other hand, access to the selective RP scheme is difficult outwith designated areas. Jones (2012) shows that uptake of both schemes is generally extremely low in the most marginal parishes of North West Scotland:
- agri-environment payments are calculated on the basis of additional costs and income foregone (there is no significant element of transaction costs in Scottish agri-environment schemes) and in principle these payments should not contribute to the basic economy of the farming system;
- one possible exception is the agri-environment payment for the reintroduction or maintenance of traditional cattle herds on small farms. However, since the total number of participants in this option is below 300 and each one only has to retain or introduce two cows, this unlikely to affect the overall picture.

Scotland uses the historic model for calculating SPS entitlements, based on the area and direct payment receipts for that land in the 2000-2002 reference period. This means that

SPS payments per hectare vary from farm to farm across Scotland. To estimate the SPS payment for the suckler cow farm in this example, it is calculated that each cow 'generates' around €175 of historically-based SPS[52]. With 100 cows on 716 hectares, this is equivalent to approximately €24.50 per hectare SPS payment for this type of farm.

LFA payments in Scotland are also highly differentiated by location and historic stocking levels on the farm (as explained in Chapter 8). It is assumed that the suckler cow farm is in the 'fragile mainland' area, that in the historic reference period more than 50 per cent of the livestock units were cattle, and that the stocking density has remained between 0.12 and 0.19 LU/ha, giving an estimated payment of €22.09 per hectare[53].

Suckler cow systems are also eligible for the coupled Article 68 Scottish Beef Calf Scheme, paid on calves born on the farm at a rate of €118.20 for the first eligible animals and €59.10 for the remainder[54]. This was worth an average of €67.49 per cow or €9.43 per hectare to the QMS sample farms quoted below. However, as this payment is coupled, it has already been included in the enterprise gross margin figures below.

Alongside this €9.43 of coupled CAP support, the suckler cow farm also receives an estimated total decoupled CAP support income from SPS and LFA payments of €24.52 + €22.09 = €46.41 per hectare, but even if these decoupled CAP payments are offset against the loss from the suckler cow enterprise of €65 per hectare, the farmer makes a loss of €17.96 per hectare (or €128.59 per breeding cow). The equivalent figure for hill sheep shows a loss of €20.15 per hectare.

In the short term, the businesses are maintained through a combination of a familiarity with and tacit acceptance of low incomes and by cross-subsidy from non-farm income (partner's job, additional off-farm job by the producer, state pension or other social payments). While this gives the system certain resilience in the short-term, it makes it extremely vulnerable to disruption at times of generational change. At times in the past, this has led to whole areas of the country being sold to forestry interests for planting. The fact that cattle are *not* the farming of last resort also makes cattle systems (highly valued by conservationists) rather *more* vulnerable to abandonment than sheep systems – the farmer can keep going, but on a sheep-only basis.

5.3.3 Options available to famers managing uneconomic low-intensity HNV livestock systems

As section 5.2 showed, the poor economic viability of HNVF livestock systems is not just a problem in Scotland, for many other HNV hill farming systems in the UK the CAP payments represent more than 100 per cent of the total farm income and are offset against a loss-

[52] Own calculation based on the assumptions that: there has been no change in SPS entitlements since the 2000-2002 reference period; that in 2005 for SPS entitlements and that calves were sold without the then available Beef Special Premium claim; each breeding cow received of the order of around €250 in headage payments under Pillar 1 comprising €190 of Suckler Cow Premium and €60 of Extensification Premium. To calculate the equivalent SPS payment per cow now, it is assumed that 20% of the historic €250 is deducted for modulation to Pillar 2 and a further 10% for the Art. 68 Scottish Beef Calf Scheme.

[53] Calculated as a base payment of €77.81, multiplied by the stocking mix coefficient of 1.7 and stocking density coefficient of 0.167.

[54] http://www.scotland.gov.uk/News/Releases/2012/04/beef-calf [last accessed 28 March 2014].

making livestock enterprise. In this example from North West Scotland the CAP payments are modest and not sufficient cover the losses made by the livestock enterprise.

It would seem that the real choices for the farmer in North West Scotland seeking to improve the farm's financial situation are how he/she would rather be spending *time,* and whether his/her income could be improved by:

- reducing the scale of the livestock enterprise and hence the loss;
- ceasing livestock production altogether but continuing the minimum level of land management required to claim CAP support ('minimal farming'), leaving the farmer free to earn additional income from non-farming activities such as tourism;
- abandoning the farmland, continuing to live there but seeking employment in the wider economy, possibly some distance away.

The effect of these options on farm income are discussed below and shown in Table 5.3. The CAP income support and LFA payments are key to the first two options but it is important to stress that the link between LFA payments and the suckler cow system is very tenuous and agri-environment income is not significant for the majority of such farms outside designated areas, which means that as structured at present CAP support alone *does not ensure that this HNV system would survive*.

From the farmer's point of view, reducing the livestock enterprise is not only a reasonable way to increase net income, but also to minimise risk, because small market changes in the sale price of calves or the cost of inputs can produce a large effect in the farm's business performance. For example an increase in costs of 16 per cent would absorb the *whole* of the farm's SPS income.

Reducing the scale of the livestock enterprise to the minimum required to qualify for LFA payments would reduce the business loss but not affect SPS and LFA payments. The LFA payment is intended to be targeted at *active* farmers (in the sense of carrying out actual farming, eg by having livestock, not just maintaining land in GAEC). From the farmer's point of view, a big change in stocking levels would trigger an inspection at very least, but because the same LFA stocking density coefficient applies to holdings with livestock densities down to 0.12 LU/ha, it should not be difficult to argue that a reduction in activity of around one third (from 0.18 down to 0.12) is acceptable without question of penalty. This means that simply by reducing the number of suckler cows from 100 to 66 the farmer could improve the overall income by more than €14 per hectare.

Typical HNVF landscape with hill sheep, Skye; note the low stocking density.(Image: Richard Dorrell, Creative Commons Licence)

Ceasing livestock production would mean foregoing LFA payments but not SPS, which is completely decoupled from any farming system. Although to claim SPS *someone* would need to do some grazing and/or mowing to meet GAEC cross-compliance and 'active farming' requirements in the future, there is no need for the farmer to keep livestock or undertake the maintenance work involved. If this is done by someone else without charge (there are cases where the grazier actually pays rent to the inactive 'farmer'), then the claimant makes a profit of around €24.52 per hectare (the full SPS payment). Claiming SPS but not LFA, and paying someone else €10 per hectare to undertake this minimum maintenance would still produce an overall income of €14.52 per hectare in the cattle system - an improvement of €32.39 per hectare in the holding's financial situation when compared to the current loss of €17.97 per hectare.

Within the framework of current CAP payments and the way these are implemented in Scotland, Table 5.3 illustrates the potential improvement in farm income resulting from scaling down this particular HNV farming system, showing clearly that the farmer would have a better income and more time free for other activities or employment if he/she reduced or ceased his HNV livestock farming.

Table 5.3: Example of HNV livestock production in North West Scotland

	Hill suckler system			Hill sheep (store lamb) system		
	→ (decreasing activity)			→ (decreasing activity)		
	Business as usual active farming	Subsidy-adjusted active farming?	'Minimal farming'	Business as usual active farming	Subsidy-adjusted active farming?	'Minimal farming'
Subsidy claimant's LU/ha	0.18	0.12	0	0.15	0.12	0
Income from agricultural production €/ha (note: includes coupled beef calf payment in case of suckler system)	89.79	47.77	0	39.52	26.34	0
Estimated real costs of agricultural production €/ha (taken to be proportional to stocking density, ie purely variable, for 'subsidy-adjusted' system)	-154.38	-82.13	Small	-89.69	-59.80	Small
SPS €/ha (strongly coupled to historic and decoupled from current production)	24.52	24.52	24.52	17.04	17.04	17.04
LFA payments €/ha (strongly coupled to historic and moderately and uncertainly coupled to current production)	22.09	22.09	0	12.99	12.99	0
Total for farm enterprises €/ha	**-17.97**	**-3.56**	**~24.52**	**-20.15**	**-3.42**	**~17.04**

5.3.4 Conclusions drawn from the North West Scotland example

This analysis illustrates the very mixed signals being given by current Scottish policy to HNVF livestock farming. In Scotland both LFA and direct payments are linked to *historic* activity, so that the bulk of the money still goes to the best land in the LFA and in Scotland as a whole, respectively. In the case of the North West Scotland farm example discussed here, CAP support is insufficient in total to cross-subsidise the HNVF farm enterprise adequately, and the structure and balance of current support does not ensure the continuation of HNV livestock farming on semi-natural habitats.

The Article 68 Scottish Beef Calf Scheme, which is unambiguously coupled to the HNV farming system, provides a definite incentive but, as the figures illustrate, even with this payment included in the analysis of farm business income, the HNVF system still makes a loss.

Agri-environment payments were not originally designed to maintain existing activity, but could be used for this purpose where that activity is deemed in danger of imminent abandonment. However, looking at the overall picture, Scottish agri-environment schemes

are both too targeted at designated areas and, in terms of the prescriptions, too 'deep and narrow' to be effective at maintaining low-intensity systems over the whole North West Highlands region.

This example illustrates why changes to CAP payments are needed to target the needs of these systems and provide them with the opportunities to innovate while maintaining their HNVF quality.

5.4 Dependence of HNV farming on CAP income support and LFA payments

This analysis has shown that HNV farms have economic problems that are a direct consequence of their low-intensity farming systems. Many of these (particularly livestock farms) have been partly or wholly dependent on CAP direct payments and LFA payments for economic survival for at least the past 10 years and almost certainly longer. In some cases the CAP payments are insufficient to cover the loss from the farm business, and those farms are particularly vulnerable to small economic shocks. More targeted CAP payments to encourage the *continuation of HNV farming systems* (not just farming) could be provided through Article 68 environmentally coupled payments and agri-environment payments, but in many Member States these budgets are dwarfed by the scale of the SPS and LFA budgets and not all HNV farmers currently have access to HNV agri-environment schemes. Even where available, agri-environment payment calculations rarely address the opportunity cost of HNVF farming (the amount lost by not using the resources of land, labour or capital in the best alternative use (Begg, Fischer and Dornbusch, 1997)). For non-economic HNV farmers (or more probably their younger successors) the best alternative use for their labour and capital could be employment outside farming. This generational change effect will be exacerbated in some of the new Member States where the opportunity cost of labour can be expected to rise for several years as their CAP Pillar 1 budgets increase and their rural economies restructure. The extent to which HNV farmers benefit from these increased CAP support payments will depend on the how Member States choose to allocate CAP direct payments to different types of farm, and if they define eligibility for CAP payments to include the HNV farms and farmers that are currently ineligible. In this example from Scotland the LFA payments are a significant element of CAP support and paid to almost all LFA farmers but this is not the case in all Member States. In England and Wales LFA payments have been phased out, and in Spain (which has the largest LFA area of all Member States) the payment is small and available to only minority of LFA farmers. It is very clear from the analysis here that the future availability of CAP direct payments and also of LFA/ANC payments could determine whether or not current HNV farming systems survive, but equally could be a factor hastening the loss of the HNV resource if these payments are insufficiently linked to HNV farming practices. These issues are discussed further in Chapter 11.

6 Rural development (CAP Pillar 2) and similar support for HNVF

Key findings

- **Many Member States have specifically designed and targeted agri-environment schemes for the management HNVF semi-natural habitats, species and native breeds of livestock, but in some cases eligibility criteria and/or funding have limited the capacity of these schemes to reach all the HNV farmland that could benefit. Less focused agri-environment schemes may also benefit HNVF to some extent. In some Member States the coverage of HNV farming by beneficial agri-environment schemes is considerable while in others it is extremely limited, including some with a major HNVF resource, for example Spain. A few Member States make significant use of state aid to fill gaps in coverage of agri-environment payments and for habitat restoration.**

- **Natura 2000 payments to compensate farmers for legally binding restrictions were used in some Member States, but by 2009 only five had achieved their targets, largely due to delays in setting legally defined requirements.**

- **More use could have been made of RDP non-productive investment support for restoration of HNVF habitats and landscape features.**

- **LFA payments account for a significant share of many RDP budgets but rarely require or support HNV farming systems and practices, other than sometimes setting minimum grazing levels. LFA payments can contribute to HNV farm incomes but levels of support and coverage of farmers varies greatly.**

- **There are some Member States that have used Article 68 and Article 111 coupled payments from Pillar 1 in a targeted way to support threatened HNV pastoral livestock farming systems.**

- **Few examples were found of other RDP measures or the LEADER approach being used specifically to support HNV farming. Also, it is unclear to what extent measures to support competitiveness of farming are available to and used by HNV farmers, or if there are safeguards to protect HNVF from damaging intensification.**

This chapter provides an overview of rural development measures (under the EAFRD) and other environmental land management support used by selected Member States or regions during the 2007-13 programming period in a way that provides at least some benefit to HNVF. This include measures from all three axes of EAFRD and use of the Leader approach, LIFE funding, state aid and also some Pillar 1 coupled livestock support under Articles 68 and 111 (but only where these provide a specific incentive to maintain HNV farming systems). An attempt has been made to calculate at Member State or regional level how much of the annual public expenditure on these measures benefits HNVF at least to some extent. The limitations of the way in which EAFRD expenditure data are reported make this a difficult task and the resulting estimates are necessarily rather crude. However, they do give an indication, for some Member States and regions, of the scale of rural development type expenditure currently directed towards HNVF.

The analysis is based on case studies at Member State and regional level. The case study experts were asked to identify the different types and sources of public expenditure that are relevant to support for HNV farming and to provide details of the public funding allocated to each of these measures by the Member State or region. To provide a clearer picture of the

extent to which different funding sources actually benefit HNVF farming systems (rather than farming generally) the experts were asked to use their judgement to distinguish three categories of expenditure that:

- is explicitly intended only for HNVF;
- directly benefits HNVF but is not 'labelled' as HNVF; and
- supports HNVF to some extent.

The case study experts were also asked to provide details of eligibility rules and farm level requirements (where available) by measure and Member State. This information was used to provide an inventory of public expenditure that provides at least some benefit for HNVF.

6.1 Overview of use of EAFRD measures to support HNVF

Member States had a total of 43 rural development measures[55] from which to choose in order to provide support to HNVF through the 2007-13 RDPs. The environmental land management measures were widely used in the 20 Member States for which information was provided by the case studies although the extent to which these actually benefit HNVF varies considerably. All of these Member States used the agri-environment measure to support HNV farmland management and many (but not all) used the Natura 2000 compensation measure too. LFA payments and a wider range of EAFRD measures are also considered to make a contribution to supporting HNVF in several Member States, although the scale of this may be quite small in the context of overall EAFRD support. The way in which Member States' EAFRD expenditure is recorded as totals for each measure makes it impossible to identify HNVF specific expenditure within RDP payment schemes that are available to farmers more generally. Only in the case of Natura 2000 payments and some agri-environment schemes targeted specifically at HNVF farmland, habitats or species is it possible to infer that the expenditure is wholly of benefit to HNV farming. The use of the most important measures is discussed below, with selected examples from Member States summarised in Box 6.1.

6.1.1 Agri-environment payments and non-productive investment support

Agri-environment payments can have a wide range of objectives on many different types of farmland, but the analysis for this study has shown that in many Member States agri-environment schemes have been designed to support HNVF management in a highly targeted way. Where there are several 'levels' of agri-environment schemes, as in France and the United Kingdom, HNV specific schemes tend to be found in the higher level, most targeted schemes, and in England land management requirements may even be defined specifically for individual farms. Within the 24 agri-environment schemes in Aragón (Spain) there are schemes relevant to several HNV farming systems: mountain livestock farming, dryland arable, low-intensity rice production and traditional permanent crops. Management of HNV Type 1 semi-natural habitats or of Type 3 farmland for migrating or breeding birds is supported by specific sub-schemes in several Member States.

The agri-environment measure is also used to support HNVF in Natura 2000 areas (for example in Bulgaria, Estonia, Spain, Portugal, France and the United Kingdom). In Finland there are agri-environment payments for HNV wooded pasture with more than 50 trees/ha,

[55] An additional measure (143) was made available specifically for the provision of farm advisory and extension services in Bulgaria and Romania.

and in Slovenia and the Czech Republic grassland schemes are targeted at known semi-natural grassland habitat locations. The use of local cereal cultivars on HNV mountain arable land is supported in Italy and payments provided to encourage the use of local breeds of livestock in Estonia, Portugal, Italy and other Member States. Support for organic farming is judged to benefit HNVF in Germany, Estonia, Italy, Romania and Spain.

Surprisingly few Member States make use of non-productive investment support for HNVF. Where this measure is used, it provides payments for the restoration of traditional stone walls in Estonia and of hedgerows, trees, water courses, stone walls and terraces in Italy. In Finland this measure is used to restore degraded semi-natural grasslands so that grazing and mowing can resume.

6.1.2 Natura 2000 compensation payments

The Natura 2000 measure is rather different from other rural development measures in that it provides compensation payments for restrictions on farmland management imposed by implementation of the Habitats and Birds Directives. This measure is designed specifically for situations where legal obligations under the Birds and Habitats Directives apply at farm level. For farmland management going beyond legal obligations (or where there is no legal obligation at farm level) the agri-environment measure can be used.

Natura 2000 compensation payments depend on formal designation of the Natura 2000 site and the existence of a management plan or equivalent legislation that specifies the management actions that farmers are legally required to carry out. Only a few Member States allocated significant funding to this measure in their 2007-2013 RDP budgets and by 2009 only Germany, the Czech Republic, Estonia, Lithuania and Latvia had reached their targets[56]. The failure of planned implementation of this measure in other Member States is partly because many Natura 2000 sites do not yet have defined management requirements, which means that Member States have not been able to release any payments. Some Member States have applied restrictions on its use. For example, in Bulgaria payments are available only in Natura 2000 farmland areas designated under the Birds Directive, not under the Habitats Directive; in Greece Natura 2000 payments are available only to farmers who do not receive other CAP support; and in Latvia important HNV Type 1 land is ineligible (including all wooded pastures, heathland, dune and fen habitats).

6.1.3 LFA support

In most of the Member States studied LFA expenditure is judged to be of some benefit to HNVF, but in most the link to HNV farming practices is either absent or where it exists is weak, in the form of limits on stocking rates (minima and maxima). If the economic incentive is sufficient these do have the advantage of ensuring that the land is grazed (rather than just mown annually) but the rates may not always be appropriate for HNV grazed habitats; for example in Ireland the minimum stocking rate is 0.3 LU/ha but this excludes HNVF heathland typically grazed at no more than 0.15 LU/ha. Of the Member States examined here, France appears to have made the most effort to use LFA payments to

[56] European Network for Rural Development (2011) Rural Development Programmes 2007-2013 Output Indicators realised 2007-2009. Measure 213: Natura 2000 payments and payments linked to Directive 2000/60/EC (WFD) (updated June 2011). http://enrd.ec.europa.eu/policy-in-action/rural-development-policy-in-figures/rdp-monitoring-indicator-tables/output-indicators/en/output-indicators_en.cfm

support specific HNVF systems. Common grazing land and non-herbaceous pastures are eligible, there are different stocking rates specified for extensive sheep and goat pastoral systems and mountain dairy systems, a higher payment rate for the first 25 hectares, and an additional payment for transhumance systems. In England and Wales the LFA measure has now been phased out altogether, because it was decided that if the focus was to be on achieving environmental outcomes within the LFA areas the agri-environment measure was the preferred means of support. In Spain, which has the largest LFA of all Member States, there is an upper limit on the payment per holding which greatly restricts the income available from this measure to the extent that RDP evaluations have concluded it has practically no effect on farmers' decisions or on the maintenance of farming in the LFA. Furthermore, a large proportion of LFA farmers (especially the smaller, part-time farms) are excluded from the scheme by eligibility rules.

6.1.4 Other RDP measures used to support HNVF (including the Leader approach)

In some Member States expenditure on several other EAFRD measures is seen as providing at least some benefit to HNVF, although the scope of implementation is not confined to HNVF and covers other farming systems and wider objectives.

In Bulgaria and Hungary all beneficiaries of agri-environment and semi-subsistence support are required to undertake training, funded under Axis 1 of EAFRD. Romania also offers similar services but does not make participation obligatory. Estonia supports the provision and use of vocational training courses for land managers and information services for advisers. Ireland also offers vocational training with priority given to LFA farmers, among others.

Other support for young farmers, early retirement, modernisation of farm holdings, adding value to and improving the quality of produce and developing farm infrastructure are identified in some Member States as potential sources of support for HNVF. However, the way these measures have been implemented means that none of the schemes are specifically designed for or targeted at HNVF, all appear to lack safeguards to protect HNVF systems, and many have the potential to support the intensification of HNVF farms.

Rural development measures to promote farm diversification, business development, tourism, village renewal and conservation of the rural heritage are identified as having the potential to support HNVF but only in Portugal has such support been targeted at HNV Type 1 and 2 farmland in the Natura 2000 areas that benefit from the Integrated Territorial Intervention (ITI) programme. There appear to be no projects funded through the Leader approach that are focussed on HNVF and the German case study was the only one to mention this as being of some potential benefit.

Box 6.1: Examples of support measures of benefit to HNVF in different Member States

Pillar 2 support considered to be of some benefit to HNV farming systems

Vocational training and information (measure 111)

- **Austria**: for monitoring, documenting and declaring rare plant and animal species in HNVF extensively cultivated lowland grassland, semi-intensively cultivated meadows and pastures, and traditional orchards.

LFA and other natural handicap areas (measure 212)

- **Finland:** for typical Scandinavian wooded pastures which fall outside of the '50 trees/ha' definition for

Pillar 1 payments.

- **Slovakia**: for semi-natural grassland habitats (pastures and meadows) but only available to registered farmers, not NGOs owning agricultural land (including within Natura 2000 areas).

Natura 2000 compensation payments (measure 213)

- **Bulgaria:** for farmers in Natura 2000 Birds Directive sites (109 sites amounting to 599,871 ha), but this support is not available for Natura 2000 areas under the Habitats Directive.
- **Hungary:** for farmers managing Natura 2000 grasslands which are identified in LPIS.
- **Ireland:** only to specific farms in Natura 2000 sites, Natura 2000 habitats outside of designated areas are excluded.

Agri-environment payments (measure 214)

- **Austria:** for alpine meadows and pastures; management requirements include maximum livestock density and specified grazing and mowing dates, limits to inputs, and preservation of landscape elements.
- **Bulgaria:** for grassland management on subsistence, semi-subsistence and family farms. Farmers must specify whether the grassland will be mown or grazed. Management requirements include limits to inputs, minimum tillage practices and no new drainage. Mowing must be carried out within specific dates and must be manual, or using a slow grass-cutting machine (to limit disturbance to wildlife). Following mowing, there should be free grazing on meadows, except where this is harmful to plant species of European conservation importance. Where grassland is grazed, farmer must comply with minimum and maximum livestock densities which apply to the whole grazing area within the farmer's block.
- **Bulgaria:** targeted at habitats of European ground squirrel, Golden eagle and Egyptian vulture, for conversion of intensively managed arable land to extensive systems. These areas cannot then be ploughed and must be grazed, keeping within the specified maximum livestock density limits.
- **Estonia:** for management of semi-natural habitats: coastal meadows, wooded meadows, wooded pastures, Nordic alvars, and floodplain meadows; management requirements include specified mowing regime (restricted mowing dates and methods), specified vegetation management and protection of valuable landscape elements identified on maps. (Semi-natural habitats receiving this agri-environment payment cannot receive any other Pillar 2 payment).
- **Greece:** for specific farming systems or areas associated with HNV farming, for example cultivation of Thira grapevines and Amfissa olives, and for non-irrigated arable land in the regions of Lake Koronia and Argolida. Farmers must follow an environmental management plan (for two to five years, depending on the scheme).
- **Finland:** the following schemes are all available for wooded pastures that fall outside '50 trees/ha' definition of agricultural land eligible for CAP direct payments:
  - Grazing on semi-natural and permanent grasslands; management requirements include grazing and/or mowing, and no addition of nutrients (through feed).
  - Mowing semi-natural grasslands.
  - On small farms, the establishment and management (mainly by mowing) of ecotone habitats (buffer zones, forest/field edges).
- **Italy:** for the cultivation of endangered crops (for example in Apulia), and the breeding of endangered animal species (for example in Bolzano). Agri-environment payments can also target farmland managed for species of European conservation importance, for example the protection of the Little bustard (*Tetrax tetrax*) in Sardinia. This support is available for permanent grasslands, improved grasslands, arable cropland and fallow areas within Natura 2000 sites, and requires specified grazing and cutting regimes, restricted management dates, and planting of legumes/fodder crops for wildlife.
- **Netherlands:** agri-environment payments for farmland bird habitat management are often awarded to groups of farmers that have organised themselves into so-called '*collectieven*'. Farmers can opt for different kind of management packages, each with its own set of farm level actions, eg: postponed mowing regime, seasonal flooding, restrictions on the use of agrochemicals.
- **Romania:** available for all HNV grasslands identified in IACS. Management requirements include no artificial fertilisers, manure < 30 kg N/ha, meadows must be mown at least once per year, after 1 July. Pastures grazed at <1 LU / ha, no ploughing, rolling or reseeding. Agri-environment payments can also target specific bird species (*Crex crex, Lanius minor* and *Falco vespertinus*), and specific butterfly species (*Maculinea sp*).
- **Slovakia:** for semi-natural grasslands with biodiversity value (according to Grassland Inventory of

Slovakia), with management requirements specific to seven different types of grassland habitat. Support is available to registered farmers managing >1ha of grassland registered as agricultural land in LPIS, but not to NGOs owning agricultural land in protected areas (including Natura 2000 areas).

- **Slovenia:** for preservation of bird habitats on humid extensive meadows in the Natura 2000 areas and butterfly habitats registered in selected Ecologically Important Areas. Management requirements include specified mowing regime, no/or limited grazing, no synthetic inputs and compulsory pruning and thinning of woodland and hedges every second year. Agri-environment schemes also support:
  - special grassland habitats within selected Ecologically Important Areas;
  - within defined areas where livestock are at risk from large carnivores, grazing of: grasslands with trees, trees and shrubs, and extensively managed grassland in both subalpine areas and lowlands.

Non-**productive investments** (measure 216)

- **Estonia**: for establishment or restoration of stonewalls where these are traditional. Walls must be: in suitable location, of a specified minimum height, using traditional materials and layout characteristic of the region, and approved by the National Heritage Board. It is forbidden to take stones from burial mounds, seashores, valuable landscape elements. The new/restored stone wall must be maintained for at least 5 years.
- **Finland:** for the restoration of semi-natural pasture to enable subsequent grazing/mowing, including wooded pastures that fall outside the 50 trees/ha definition.
- **Sweden:** agri-environment support coupled with non-productive investments for restoration of semi-natural pastures and meadows of high biodiversity or cultural heritage values that have become overgrown. Restoration must be in accordance with a pre-approved plan and selection of applications is based on regional priorities.

Conservation and upgrading of rural heritage (measure 323)

- **Italy**: used in many regions to support the preparation of Natura 2000 management plans.

Article 68 (Pillar 1) support considered to be of some benefit to HNV farming systems

- **Finland**: for cattle farms that pasture their animals on semi-natural and permanent grasslands.
- **France**: for extensive dairy systems in mountain areas (mountain milk premium), and also for extensive pastoral systems grazing sheep and goats (sheep/goat premium).
- **Ireland**: used specifically in the Burren area, targeted at farms with species rich dry calcareous grasslands. Each farmer's payment depends on the quality of his/her species rich grasslands that year, thus rewarding improved habitat management.
- **Netherlands**: payments for using permanent grasslands that can only be accessed by boat.
- **Portugal**: for the management of traditional olive groves, with reduced tillage and annual harvesting of olives. Also for farmers maintaining a well-functioning traditional irrigation system on HNV irrigated pastures called '*lameiros*', which support low-intensity semi-natural grazing systems.
- **Spain**: for sheep and goat management on HNV areas, including grass and shrub steppes, mosaics of arable/grass/shrub pastures, *dehesa*, and dryland arable.

6.2 Article 68 and Article 111 payments under CAP Pillar 1

Article 68 payments[57] have the potential to be a very effective complement to HNVF agri-environment payments, if targeted specifically at the characteristic HNVF livestock systems that provide the grazing required by agri-environment land management contracts. Member States may choose to use up to 10 per cent of their national budget ceiling for CAP direct payments to make annual payments coupled to specific production systems undergoing difficulties, where these are particularly important for economic, social or environmental reasons. Twenty-four Member States have used Article 68 in 113 different schemes (mostly based on coupled direct payments) with a total budget allocation for the 2010–13 period of 6.4 billion euros (ECA, 2013). At EU level only 19 per cent of this budget is allocated to addressing 'specific disadvantages in vulnerable or sensitive areas or affecting

[57] Article 68 of Council Regulation (EC 73/2009).

vulnerable types of farming', and only six Member States use it for this purpose. Of these France, Italy and Spain account for the bulk of this type of expenditure (ECA, 2013).

In Spain there is a coupled payment for sheep and goats in the LFA, which helps HNVF livestock systems in the mountains, on grass and shrub steppes, *dehesa* and in dryland arable areas. In the region of Aragón the 2012 budget for Article 68 was reported to be €4.8 million, a similar amount to the annual expenditure on the main agri-environment support for extensive livestock (pastures, hay meadows, rare breeds). In France there is a top-up payment per litre of milk produced by extensive dairy systems in the mountains, and a headage payment for sheep and goats which benefits extensive pastoral systems. A highly targeted Article 68 scheme supports species rich dry grasslands in the Burren Natura 2000 area of Ireland. Portugal uses Article 68 to support several important HNVF systems including traditional olive groves, the *montado* silvo-pastoral systems and the traditional irrigated systems of grazed semi-natural pastures *lameiros.* In France the Article 111 measure (a coupled Pillar 1 payment) is used to the support suckler cow systems generally, which will benefit some HNVF producers.

6.3 State aid for HNVF habitat restoration

Two of the 20 Member States provide an additional state aid support targeted specifically at Type 1 HNV semi-natural habitats not supported by current agri-environment payments. These are an important source of funding for HNVF habitat restoration in Estonia and also relevant in Finland.

In Estonia, three years before EU accession, the Ministry of Environment introduced state aid support for the restoration and management of semi-natural habitats and this remains the main source of funding for habitat restoration in protected areas. According to the latest information (MoE, 2013), approximately €3.38 million in total has been spent on nature conservation works for period 2007-2012 with 7,900 hectares of habitats restored and around 100 hectares managed. This state aid investment in restoration has been complemented since 2007 by EAFRD funded agri-environment management payments for semi-natural habitats within Natura 2000 areas. Estonia also uses the European Regional Development Fund to support restoration of HNVF semi-natural habitats. For example between 2007-2012 this funded the purchase of 1,200 grazing animals, special grass cutting machinery and reconstruction of access to pastures in Matsalu and Sooma National Parks and the Alam-Pedja Nature Protection Area.

In Finland the METSO state aid scheme provides around €95,000 a year for the restoration and management of formerly grazed HNVF forests and wooded pastures.

6.4 LIFE funding for HNVF

In Slovakia LIFE funding has helped to restore natural and semi-natural habitats by providing support for the reintroduction of traditional extensive agricultural management and piloting or revising agri-environment schemes, and LIFE funding In Latvia is understood to have contributed to restoration of habitats or species of EU importance in Natura 2000 sites.

6.5 Estimating public expenditure on EAFRD measures that benefits HNVF

The Member State experts were asked to identify the different types and sources of public expenditure which benefit HNV farming systems and to provide details of the public funding allocated to each of these measures by Member State. This included not just CAP but also other sources, such as LIFE and state aid.

For each type of support identified the experts were asked to estimate what proportion benefitted HNVF. This is no easy task, because the way the CAP and other expenditure data are reported means that it is rarely possible to determine precisely how much of the expenditure on a particular measure is spent on HNV farmland. The resulting estimates of expenditure in some Member States and regions must therefore be regarded as best available estimates, very broad brush in nature, based on expert judgement in terms of the relevance to HNVF and their analysis and interpretation of more general data on planned expenditure. A brief summary of the methodology used is set out in Box 6.2.

Box 6.2: Methodology used to estimate current public expenditure on HNV farmland

Step 1 – Identify funding stream and annual public expenditure on each measure
Member State experts were asked, for each CAP and non-CAP measure that they had identified as benefiting HNVF to at least some extent: ***'for the 2007-10 period what is the average annual total public expenditure (EU + national/regional funds) on this support?'*** in most cases this expenditure is only available as a total at measure level and will also benefit non-HNVF land.

Step 2 – Estimate the proportion of that expenditure that benefits HNVF
Member State experts were asked two questions about each expenditure total they had identified in step 1. Firstly **'what percentage of this expenditure benefits HNVF?'** and secondly '**what percentage *of HNVF land (or farms or farmers) in this*** [*HNVF farming]* ***system benefit from this support?'*** For example, the measure 211 (LFA payments in mountain areas) in Bulgaria has an annual average expenditure of €14.5m but only 90 per cent of this support is judged to benefit HNVF.

Step 3 – Calculate (in euro) the expenditure that is judged to benefit HNVF, by measure and by Member State (or region)
The final step is to calculate the best estimate of **annual expenditure of benefit to HNVF for each measure in each Member State (or region)** by multiplying the total expenditure by the proportion that benefits HNVF. In the Bulgaria example above for measure 211 (LFA payments in mountain areas) the calculation would be: €14.5m x 90% = €13.1m.

Table 6.1 shows, for selected Member States and regions, a breakdown of the current expenditure on HNVF provided through the EAFRD, as well as coupled Pillar 1 Article 68 and Article 111 payments. It must be stressed that the information presented here is based largely on expert judgement and that the total figures presented do not necessarily cover all expenditure of this type in each Member State. Therefore any figures quoted should be considered to give **a broad estimate of the current level of expenditure in selected Member States and regions** only.

Within the EAFRD, the largest amount of expenditure benefiting HNVF comes from Axis 2 measures with LFA payments (which in most cases are not specifically supporting HNVF farming practices) making the greatest overall contribution, followed by agri-environment payments which *do* specifically support HNVF farming practices. Within Axis 1 by far the largest contribution comes from support for setting up young farmers, although the extent

to which this measure benefits HNVF depends entirely on how individual beneficiaries choose to use the funding, which could equally be to intensify HNVF farms.

Table 6.1: Estimated public expenditure under EAFRD and coupled Pillar 1 payments that benefits HNVF in selected Member States

(€ million/year, during 2007-13 programme)

Member States[58]	Measure				
	Axis 1	Axis 2	EAFRD Total	Art 111**	Art 68**
Bulgaria*	2.3	18.9	21.2		
Cyprus	1.1	7.9	9		
Czech republic*		7.6	7.6		
Germany National		0.26	0.27		
Germany - Baden-Wuerttemberg		0.05	0.06		
Estonia*		26.18	26.1		
Greece		3.8	3.8		
Spain – Aragón *		7.8	7.8		4.3
Finland*		60	60		
France*		513	513	64.6	
Ireland*		12.5	12.5		0.95
Latvia		18.6	18.6		
Netherlands		39.5	39.5		
Portugal*	12.9	57	69.9		6.1
Slovenia		9.3	9.3		
UK	1.4	335.2	336.5		

Notes: *Figures exclude some measures that benefit HNV because insufficient data was available on which to calculate current expenditure levels; ** Council Regulation (EC) No 73/2009.

6.6 Discussion of Member States' use of EAFRD and related expenditure

The case studies reveal some good examples of carefully designed and targeted HNVF agri-environment schemes, particularly for management of HNV Type 1 habitats and HNV Type 3 species of European importance, and also of support for locally adapted breeds of HNV livestock and crop varieties. Agri-environment payments for organic production are used in some Member States to the benefit of HNV Type 2 low-intensity mixed faming. There is surprisingly very little use of non-productive investments for the restoration and maintenance of landscape features or for the initial restoration work on recently abandoned HNVF land. In a few instances restoration work is funded from non-CAP sources but there is clearly an opportunity to make more use of the non-productive investment measure for HNVF.

Expenditure on LFA payments is clearly of benefit to HNVF farm *incomes* in the mountains and other marginal land, although the level of support and proportion of HNV farms receiving support varies greatly between Member States. In some (but not all) Member States the payments require a minimum level of grazing but, as the analysis here and in Chapter 5 has shown, LFA payments as currently implemented rarely support HNVF farming

[58] For federal Member States the resources available for this study did not permit analysis of all regional data, but detailed information for at least one region is provided where possible (for example Aragón in Spain and Baden Würtemburg in Germany).

systems and *practices.* This gap has been filled in a few Member States by using Article 68 payments specifically focussed at HNVF, but these are the exception.

There appears to have been little use of and almost negligible expenditure on Axis 3 and the Leader approach for the benefit of HNVF, although several measures would be very appropriate. A locally based approach provides an ideal opportunity to involve farming communities in designing packages of EAFRD support, for example combining land management payments and training with innovative approaches to processing and marketing HNVF produce.

Many Member States allocate substantial funding to Axis 1 measures which have considerable potential to build up the economic viability of HNVF farms and the capacity of the labour force, but with very few exceptions there appears to be a lack of schemes specifically targeted at the needs of HNVF, for example for farm improvements, adding value to produce or improving quality within the HNVF farming system. It is of concern that many of these measures (and young farmer support) could have quite the opposite effect if they focus on simply increasing productivity through intensification. As Member States case study experts have noted there is a substantial need for capacity building in advisory services and improved quality of knowledge transfer, especially when targeting biodiversity management on valuable HNVF habitats, species and landscapes.

The estimates presented here illustrate the use of EAFRD and related funds by some Member States in ways which are, in the view of expert judgement, of at least some benefit to HNVF but the way in which EAFRD and other CAP expenditure is reported make it almost impossible to identify HNVF specific expenditure, other than within agri-environment programmes and the Natura 2000 measure.

7 Member State experience of developing the CMEF HNV farming indicators

Key findings

- **The requirement for Member States to define the baseline HNVF indicator of 'utilised agricultural area of HNV farmland' for the 2007-13 RDPs has generated a great deal of work across the EU, but most of it is still incomplete. The HNVF result and impact indicator have not yet been used, except in a very few cases.**
- **Insufficient data on HNVF land cover, intensity of management and biodiversity, and a lack of regularly updated datasets required to monitor change have frustrated the attempts of those Member States who sought a comprehensive definition.**
- **Others initially defined a limited baseline indicator (Natura 2000 farmland in some cases) or focused just on semi-natural habitats or on data useful for targeting agri-environment payments.**
- **Efforts to overcome the problems of finding adequate data sets to meet Commission guidelines on the baseline indicator have led some Member States to devise alternative approaches to monitoring HNVF. These include a new sample survey of farmland in Germany, enhanced IACS/LPIS data in Portugal and Finland, a combined 'basket' of existing regional datasets and sample surveys of HNVF systems in Navarra (Spain) and a GIS-based approach in Estonia combining of fifteen different indicators at a scale of 1x1 km.**

This chapter describes first the origin and purpose of the HNVF indicator set, then using data gathered for this study reviews the progress made by Member States and regions in defining the baseline indicator, and the methods and data sets used (all EU-27 Member States are covered, except Malta and Luxembourg[59]).Two innovative regional approaches to devising a combined HNVF indicator are discussed in more detail. (Proposals for improving the CMEF indicator are outlined in Chapter 11).

7.1 The Common Monitoring and Evaluation Framework (CMEF) 2007-13

A Common Monitoring and Evaluation Framework (CMEF) was established as part of the requirements of EAFRD and applied to new system of Rural Development Programmes introduced for the period 2007 – 2013[60]. Member State Managing Authorities are required to use common baseline, output, result and impact indicators defined in the CMEF to measure the progress, efficiency and effectiveness of RDPs in relation to their objectives[61]. They must also define a limited number of additional indicators for each RDP, establish data collection systems, organise evaluations and submit an annual progress report to the European Commission. Member States' Managing Authorities and Monitoring Committees are expected to use the monitoring and evaluation information to help improve the quality and implementation of their RDPs.

[59] No HNV data was available for these two Member States, which account for less than 0.2 per cent of the HNV farmland in the EU according to EEA/JRC data.

[60] Council Regulation (EC) No 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)

[61] Article 62 and Annex VIII of Commission Regulation (EC) No 1974/2006 of 15 December 2006 laying down detailed rules for the application of Council Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD).

The CMEF indicator set related to the Axis 2 objective of improving the environment and the countryside through land management includes two farmland biodiversity baseline indicators:

- population of farmland birds;
- High Nature Value farmland and forestry.

7.2 Purpose of the HNVF indicators

For the 2007-13 programming period there are three CMEF indicators on HNV farming identified in the legislation:

Baseline indicator 18	*UAA of High Nature Value farmland*
Result indicator 6	*Area under successful land management contributing to biodiversity and High Nature Value farming/forestry*
Impact indicator 5	*Changes in High Nature Value farmland and forestry*

Essentially the HNVF baseline indicator is an estimate of the extent of HNV farmland in the RDP programming area. However, the wording has been a source of problems, as the definition of UAA in some countries excludes important categories of HNV farmland that are off the farm holding, such as common grazing land. Some Member States have excluded off-farm grazing land from their HNVF calculations, while others have included it.

An overview of the current state of development of the CMEF HNV baseline indicator by Member States and regions is provided in Table 7.1 below.

The HNVF result indicator is interpreted by the EENRD (2010) as referring to HNV farmland (and forestry) that is participating in an RDP measure explicitly intended to maintain biodiversity through HNV farming on the land in question.

Under the HNVF impact indicator, Managing Authorities are required to measure what the impact of the RDP has been on the HNVF baseline over the programming period. This has been interpreted by EENRD (2008 and 2010) as requiring an assessment of changes in the extent and in the condition of HNV farmland as a minimum, and ideally also in farming systems and practices. Several Member States/regions have reported on this indicator in terms of changes to HNVF extent, although often from baselines that were not very clear in terms of what the figures comprised.

The situation with the CMEF indicators on HNV farmland has been quite confused since their introduction in 2006. The relevant policy priority as set out in the Community's Strategic Guidelines for rural development is to use Axis 2 measures to preserve HNV farming and forestry *systems*. Some Member States have been unclear as to how they should interpret this priority to preserve HNVF systems, given that the CMEF indicator terminology is focused on HNV farm*land* and HNV *areas*. The HNV indicators were introduced without explanation (EC, 2006), although they were subsequently clarified to some extent in guidance documents (EENRD, 2008 and 2010). Confusion has been created by the mix of terminology used in the CMEF, for example one Guidance Note[62] interprets

[62] EC (undated) Guidance note J – Impact Indicator Fiches

the impact indicator as follows: 'Changes in high nature value *areas*'. The term 'areas' was translated into some languages as 'zones', thus introducing a different concept from the simple extent of HNVF intended by the baseline indicator.

Overall, as set out by the EENRD (2010), the challenge facing Member States in implementing the CMEF indicators for HNVF is to:

- devise a set of indicators that will provide meaningful information on changes in the *extent* and in the *condition* of HNV farmland and forests, and on trends in HNV systems and practices, during the seven years of the RDPs: and to
- devise a method for assessing to what extent (and how) these changes and trends have been influenced by RDPs and measures.

Clearly it is impractical to contemplate methods for measuring the impact of RDPs on HNVF without first establishing an acceptable and robust method for measuring the baseline situation, using data sets that are regularly updated. The remainder of this chapter focuses on the CMEF baseline indicator for HNVF (UAA of High Nature Value farmland) because most RDP Managing Authorities are still at the stage of defining this indicator.

EENRD (2010) emphasise that establishing this baseline requires an analysis of HNVF that goes beyond mapping exercises. In fact, the CMEF Handbook itself recommends that the RDP ex-ante evaluation should include an assessment of:

- the handicaps facing farms in areas at risk of abandonment and marginalisation; and
- an overall description of biodiversity with focus on that linked to agriculture and forestry, including high nature value farming and forestry systems.

These assessments can be seen as part of a qualitative approach to establishing the HNV baseline situation that should complement the more quantitative aspects, such as estimating the number of hectares of HNVF. A qualitative assessment of the baseline situation of HNV farming would provide a practical and descriptive picture of:

- the types of HNVF present in the programme area and their approximate distribution;
- the main characteristics and practices of the farming systems and how these are related to specified biodiversity values;
- the socio-economic situation of HNVF types, main challenges faced and current perceived changes in economic pressures, in order to provide an insight into trends to be expected in the counterfactual situation, such as abandonment and/or intensification.

Such an assessment could be undertaken through multi-disciplinary studies and working groups and could also propose quantified objectives and targets which can then form the basis for evaluation of the programme and its components, as described in the CMEF guidelines.

Most Member States have not provided such a qualitative assessment of their HNV farming baseline in the 2007-13 RDPs. Until this aspect is addressed, it will be extremely difficult, if not impossible, to evaluate the impact of RDPs on HNVF. In the case of the HNV indicators, the mid-term and ex-post evaluations will depend on a considerable qualitative element,

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http://ec.europa.eu/agriculture/rurdev/eval/guidance/note_j_en.pdf

and therefore a qualitative baseline is needed against which to assess changes during the programme period.

In this context, there is a notable gap in the evaluation questions listed in current CMEF guidance[63] which makes no reference specifically to HNVF, even though for Axis 2 there are several questions asking to what extent measures have contributed to the maintenance of 'sustainable farming systems', 'the countryside', 'landscape and its features', and 'biodiversity'. EENRD (2010) suggested that for all RDP measures it would be appropriate to consider the question:

> *To what extent has the measure contributed to maintaining or improving the economic viability and/or ecological condition of HNV farming and/or forestry systems?*

7.3 Member States' initial experiences of using the HNVF baseline indicator

7.3.1 Addressing the CMEF challenge

Through the present study we have found confusion in several RDPs in the way the HNV indicators are reported. The figures provided in RDPs for the HNV farmland baseline are sometimes unclear, for example more than one figure is quoted, figures are copied incorrectly from original sources such as JRC/EEA and in some cases a figure is quoted in the text of the RDP but no figure, or a different figure, appears in the CMEF annexes. Several RDPs stated in 2007 that the indicator could not be provided, or provided very crude proxies; in some cases these gaps have been filled (for example, being reported in mid-term evaluations), or the proxy figures replaced or simply dismissed as a stop-gap or a mistake.

It is clear that most countries have found the development of the CMEF HNVF indicators to be a difficult and often frustrating experience. A common comment is that the EENRD guidance cannot be implemented in practice due to lack of sufficient data. Having said this, it is also clear that Member State/regional authorities have taken very different approaches to meeting the challenge. Some have dedicated significant financial and human resources to the challenge and have worked in a transparent way with experts and stakeholders. Some have looked for quick and simple solutions, often without consultation beyond the authority in question. Some countries have managed the work through a steering group involving representatives of farming and environmental organisations (Finland, Estonia and Scotland). This has been a positive process in these cases, providing momentum and 'buy in' from stakeholders. Others have used EAFRD Technical Assistance funds to finance the work on developing the CMEF-HNV indicator (Bulgaria, Spain indirectly through an NGO project).

7.3.2 Methods used by Member State governments to calculate the HNVF Baseline indicator

At the time the 2007-13 RDPs were approved, several Member States/regions had not prepared an HNVF indicator. A number of Member State or regions cited no HNVF indicator (eg France, England), some cited 'proxy' indicators of little relevance (eg in Ireland the area of LFA farmland, in Scotland effectively all non-urban land), and some cited a figure taken from the JRC/EEA report (eg Spain, although the figure was altered without explanation).

[63] EC (undated) Guidance note B – Evaluation guidelines.
http://ec.europa.eu/agriculture/rurdev/eval/guidance/note_b_en.pdf

Many other Member States or regions did prepare an HNVF indicator to include from the start of the RDP (eg Bulgaria, most Italian regions, Romania) while several others have developed an indicator since 2007 and included this in the MTE reports or otherwise transmitted it to the EC. This report focuses on the HNVF indicators that have been developed through analysis at Member State or regional level, rather than on the less credible indicators included by some authorities as 'stop-gaps' in their RDPs.

Although the CMEF indicator is intended purely as a monitoring and evaluation tool, it is clear that some authorities focused more on developing a tool for targeting RDP measures on HNVF, especially the agri-environment measure. This was the case for example in Bulgaria and Romania, where maps were produced using mainly land cover and species data that were the basis for agri-environment implementation. In Bulgaria the maps are also effective in revealing the very large areas of HNVF that are excluded from CAP eligibility. However, the data sets that were used are not regularly up-dated, which makes the method unsuitable as a monitoring tool and far from ideal as a CMEF indicator.

The Estonian case is similar. In the absence of a developed method for identifying all three HNVF Types in the country, the decision was taken to focus on semi-natural habitats. The baseline indicator was given as the number of hectares of semi-natural habitats within Natura 2000, partly because the best data are available for these sites and partly because the relevant agri-environment schemes included within the RDP were targeted exclusively at Natura 2000. However, there is no doubt that this figure is an underestimate of Type 1 semi-natural farmland in the country and does not consider Type 2 and Type 3 HNVF. Similarly, some other Member States chose to interpret HNVF as the farmland (in some cases only certain categories of farmland) within protected areas, such as Natura 2000 areas. This was, partly because of the difficulties of identifying HNVF in the wider countryside. However, these Member States (for example, Denmark and the Czech Republic) and Estonia all have work underway to identify a wider range of HNVF for the next round of RDPs.

In contrast, the German federal and '*Land*' authorities took the view that as no existing data sets were sufficiently comprehensive or renewable to be used for monitoring HNVF, the best approach was to devise a new data system for this purpose. The result was a relatively low-cost sample survey of 900 1x1 km squares across the country, modelled in part on the UK Countryside Survey methodology and on the approach used across the EU for monitoring farmland birds. This provides quite a robust CMEF monitoring tool but is not suitable as a tool for targeting RDP measures (and of course is not intended for that purpose).

An overview of the situation and methods used in each Member State or region is provided in Table 7.1.

Table 7.1: Member State/regional application of the CMEF indicator for HNV farmland

Member State	Region	Methods and data source	Comments
Austria		Habitats and species data, plus IACS/LPIS data on farming intensity for grasslands.	IACS/LPIS grasslands data is more detailed than in some MS. Also has advantage that it is renewed every year. The lower of two estimates of extent was chosen for CMEF.

Member State	Region	Methods and data source	Comments
Belgium	Flanders	Mapping of semi-natural farmland, mosaics with landscape elements and distribution data for certain species.	Map developed through series of work for the Department of Agriculture
	Wallonia	Farmland coinciding with Main Ecological Infrastructure.	Consists of farmland in Natura 2000, in areas proposed for Natura 2000 but not designated, and other sites of high biological interest.
Bulgaria		Combination of CORINE land cover selections, Natura 2000, IBAs, grassland habitats, distribution of selected species.	An initial exercise done by WWF for the Ministry. It is now being reviewed by other consultants.
Croatia		CORINE land cover selections refined with species distribution data and biodiversity areas (IBAs, PBAs, IPAs, Natura 2000 etc).	Work done by State Institute for Nature Protection with input from Umweltbundesamt GmbH (Austria) following the JRC/EEA method
Cyprus		System not yet defined	Work has been contracted to university
Czech Republic		Farmland within protected areas, including Natura 2000.	Not a complete baseline. Work is on-going to produce a more refined HNVF indicator
Denmark		Extensive farmland within Natura 2000	Not a complete baseline. A new approach extending beyond Natura 2000 is currently nearing completion.
Estonia		Inventory of semi-natural habitats within Natura 2000	Recognised as incomplete baseline, due to lack of data. Work on an integrated indicator method is on-going.
Finland		Allocates points to farms on basis of semi-natural grassland, permanent pasture, density of parcel edges, AE contracts, UAA in extensive uses, livestock farms, bird distribution data. Whole farm is then counted (or not) not just the HNVF.	LPIS is used because it is the only data set covering all farmland and up-dated regularly (annually). This was considered essential for the indicator. Wooded pastures not included.
France		No indicator established	Study currently underway to define indicator.
Germany		New sample survey of 900 1x1km squares, transects are used to record indicator spp (flora) and landscape elements.	Existing data sets were found to be insufficient hence the new system. Survey is repeated every 2 years.
Greece		Target area for AE measures.	Not a real baseline. HNVF map also exists.
Hungary		HNVF areas designated using protected areas plus species data	The CMEF indicator is in fact the number of farmers in AE schemes within the designated HNVF areas, so not a real baseline.
Ireland		LFA	LFA in Ireland includes a lot of farmland in intensive use. Not a real baseline. Study currently underway to define indicator.
Italy		Each region used its own system for the 2007-13 RDP, variously using CORINE, agricultural statistics and IACS/LPIS	In some cases the methods were changed for the MTE. Refinement and harmonisation are on-going.
Latvia		System not yet defined	Work is on-going
Lithuania		Natural grasslands, according to the national grassland inventory; areas where RDP measures targeted at biodiversity conservation have been or are being implemented; protected areas (including Natura 2000 network) and various types of wetlands (bogs).	Work by State Land Survey Institute (SLSI) for Ministry of Agriculture. Inclusion as a criterion of land in RDP measures creates a 'circular' indicator rather than a baseline. Work on the indicators is on-going.
Luxembourg		Information not obtained	
Malta		Information not obtained	
Netherlands		Original indicator from JRC/EEA. New indicator expected based on a mix of farming, habitats, species and landscape features data.	New indicator not yet approved at time of writing
Poland		No indicator established	Work is currently underway to establish the indicator

Member State	Region	Methods and data source	Comments
Portugal		Extensive grazing systems including the montado agro-forestry system; extensive arable production/fallow land; extensive permanent cultures such as olive groves and dry fruits; high diversity farm land cover systems- mosaic. Combination based on IACS/LPIS data.	Indicator developed internally by the Gabinete Planeamento e Políticas (GPP) for Ministry of Agriculture.
Romania		HNVF area designated on basis of communes with >50% of land under permanent pasture	CMEF figure quoted in RDP is target area for AE+LFA which is far larger than the HNVF designated area. Neither are true baselines.
Slovakia		Very rough figure produced for 2010 mid term evaluation, not considered realistic	Work is currently underway to establish the indicator
Slovenia		Agricultural Land Use Monitoring database	Already used to monitor change from 2007-10
Spain		No national method has been adopted by the authorities, although some methods explored. JRC/EEA sources are used for the indicator.	Two indicator figures are given, drawn from JRC/EEA and CORINE sources, but not explained
Sweden		Data base of valuable pastures, meadows and arable land in areas with limited open land	TUVA data base founded on field surveys and gradually up-dated.
United Kingdom		Not clear how the figure is produced	The figure given is described as indicative and is no longer considered usable for CMEF
	England	Work was done to investigate two methods one using habitats and species data and another using farming data.	The trials concluded that neither method was sufficiently robust for the indicator, partly as data sets are not renewed regularly.
	Northern Ireland	Based on existing designations such as ESA, LFA, Natura 2000	
	Wales	Indicator under development	
	Scotland	Farming statistics data used to capture a farm type (livestock farms dominated by rough grazing)	Estimates were made for 2007, 2008 and 2009

The need to use regularly updated data in order to make it possible to monitor change was a concern in many Member States and regions. In several cases, experts turned to IACS and/or LPIS as the only source of regularly up-dated data related to farmland (and in some cases to farming practices). IACS data is renewed annually and LPIS is updated every one to three years depending on the Member State or region. For example, in Austria, the intensity of grassland use is recorded in IACS/LPIS (number of cuts per year) and this is used as a criterion for identifying HNVF. Portugal and Finland also base their HNVF indicators on IACS/LPIS data, with criteria in Portugal including livestock density, proportion of farmland under fallow and permanent pasture, presence of dryland permanent crops and parcel and land cover diversity.

In some other Member States or regions, agricultural data sets such as FSS and the national farm census (that feeds into FSS at EU level) were used for the same reason. In Scotland, land cover data was explored and a national map of semi-natural farmland was produced, but for the CMEF indicator it was decided to use a farm typology and farm census data. An HNVF holding type was determined using criteria such as the proportion of land under rough grazing (as a proxy for semi-natural land) and LU/ha. The CMEF baseline for HNVF is the extent of farmland used by this set of holdings.

In Italy, similar approaches have been explored at national level using FSS and also FADN data. However, this work was not used to determine the CMEF indicator, which was done by each region individually using a range of methods and data sets, mostly land-cover based.

In England, various approaches were trialled by the government nature conservation agency Natural England, including the use of semi-natural habitat inventories, a suite of farmland species from national inventories and determining HNVF holding types from census data. Overall the results were considered insufficiently robust and unsuitable for CMEF purposes precisely because the data for the favoured approach (farmland species) was not consistent or regularly updated.

Several Member States or regions have developed, or are developing systems using GIS that allocate a HNVF 'score' at a specific geographical level (eg farm holding, municipality, other defined area). Typically these apply a range of criteria such as the presence of particular habitats/species, the presence of nature designations, the proportion of farmland that is permanent pasture, livestock density and mosaic criteria. To be counted as HNVF, a given area must reach a minimum score, determined by expert judgement. This approach is being taken in Finland and Estonia (see Box 7.1). In some cases, a range of HNVF values has been determined, rather than a single value. In this way, it is possible to estimate the extent of 'lower-HNV', 'medium-HNV' and 'higher-HNV', for example. This approach has been tested in Italy and Austria, among others.

An interesting regional approach is being developed in Navarra (Spain), illustrated in Box 7.2. This follows the EENRD (2010) recommendations that a single indicator defined in terms of hectares of HNVF is of limited value for evaluating RDP impacts and informing policy development and that a basket of indicators that monitor different aspects of HNVF in parallel may be of more use and easier to operate.

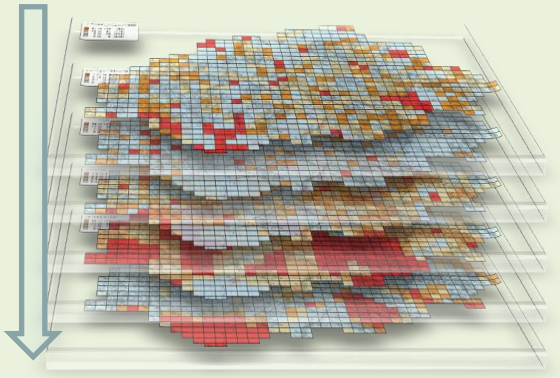
Box 7.1: A new approach to identifying HNV farmland Types 1, 2 and 3 in Estonia

Estonia has tested a new approach to defining all three Types of HNV farmland, based on a 1km^2 grid where each cell is scored for fifteen different HNVF indicators. One of the main criteria for choosing indicators was the availability of national GIS datasets (for example the Natura 2000 network, Estonian National Topographic Database, LPIS and the Bird Atlas. The fifteen indicators are divided into three groups:

- indicators of low intensity farming: proportion of agricultural land that is permanent grassland; proportion of arable land that is short-term rotational grassland; proportion of agricultural land under organic farming support; livestock density; and proportion of peat soils.
- indicators of nature value: proportion of semi-natural habitats; proportion of semi-natural habitats that is managed; species diversity of selected farmland birds (data from the Bird Atlas); proportion of protected areas and Natura 2000 areas; and presence of protected species.
- indicators of landscape mosaics: Simpson diversity index; number of field parcels; sum of length of edges of physical plots; total length of selected valuable linear features; total number of selected valuable point features.

Numeric values of every indicator are converted into a scale of 1 to 5; for example, the scale used for the indicator 'proportion of agricultural land under organic farming support' is: 0.1 to 10% scores 1 point, >10-50% scores 3 points and >50% scores 5 points. For final value-matrix of the grid all fifteen individual indicator values are totalled for each of the 1km x 1km cells, giving a merged value that corresponds to the selected HNV features and characteristics at the site (Figure 7.1). The indicators are easily updated, and the aggregated data sets can be used by different stakeholders. The methodology has been tested grid-cells equivalent in area to 18 per cent of the total Estonian territory, which can be considered as representative sample.

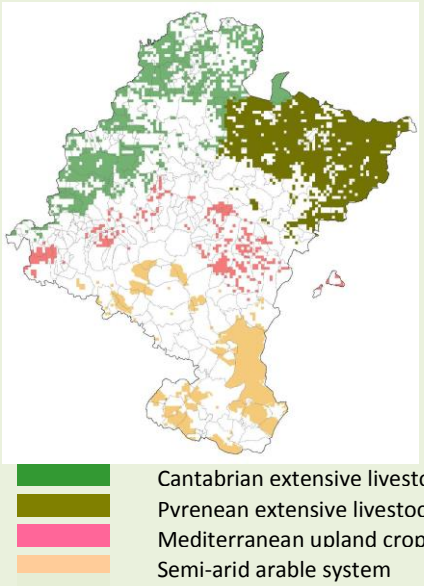
Figure 7.1: Merging the HNVF indicator values of each grid cell



Box 7.2: Developing a basket of HNVF indicators in Navarra (Spain)

The method chosen in Navarra uses a basket of indicators at regional level, based on existing and available data. For example, one indicator is hectares of semi-natural pasture, another is the number of livestock of native breeds (a clear differentiator of extensive systems in this region), another indicator measures mosaic criteria such as parcel size and diversity. Each indicator is monitored separately, but together they provide a composite picture of trends in HNVF. At sub-regional level, four distinct HNV farming systems have been identified, as shown in Figure 7.2, , and these are being analysed to clarify key characteristics, including farming practices and socio-economic circumstances. A system of sample surveys is being developed to monitor the specific characteristics of each system, through farmer interviews and field surveys. Over time, a complete monitoring system of HNVF in the region can be developed to enable robust evaluation of RDP impacts and to allow improvements to policy design and efficiency.

Figure 7.2: Concentrations of main HNVF systems in Navarra (Spain)



Note: This map, published in 2010, was developed as a tool for differentiating broad HNVF systems, which would then be studied individually to develop system indicators.

In conclusion, the CMEF-HNVF baseline indicator has generated a great deal of work across the EU, the majority of which is not yet complete. Several different approaches have been taken, so that figures are not comparable between Member States or regions. Indeed, where different approaches have been trialled within a Member State or region, these have tended to produce dissimilar results.

The main reason for the diversity of approaches is that available data sets are generally insufficient, so that experts are looking for diverse solutions to the problem. Amongst the diversity, there are some common solutions, such as the recourse to habitat inventories to attempt to locate semi-natural farmland. Many of the exercises look to IACS/LPIS data for at least part of the solution.

Proposals for improving the CMEF indicator are outlined in Chapter 11.

8 Estimating funding needs for HNV farming - a farm payments approach

Key findings

- **The need for more effective CAP support for HNVF is clear, but current HNVF expenditure is not separately identified in CAP monitoring data. Available data from three Member States with large areas of HNVF but very different farming and policy contexts was used to identify gaps in current HNVF support and explore how these might be filled.**

- **In Aragón (Spain) there are between two and three million hectares of HNVF land but estimates are problematic because of inconsistent databases and inadequate recording of farming activity in the case of rough grazing land. LFA payments are too small and thinly spread to support HNVF, and agri-environment schemes do not reach the vast majority of HNVF land (not even the majority of Natura 2000 grasslands and arable land). A five-fold increase in current LFA, agri-environment and Article 68 expenditure would be needed just to extend coverage of these schemes to all Natura 2000 farmland in the region. Alternatively, rebalancing current CAP support from both Pillars could reach more HNVF land with no increase in total CAP expenditure in the region (and reduced need for co-financing). Although there is limited scope for linking decoupled Pillar 1 payments to specific HNVF systems (other than through special measures such as Article 68) raising the level of direct payments for this HNV farmland would provide the income support element needed to accompany Pillar 2 payments targeted more specifically at HNVF land management.**

- **In Scotland around three million hectares of semi-natural pastures are managed by low-intensity HNV livestock farming, but total SPS and LFA payments for this area fall short of offsetting farm business losses by €63 million a year. More damagingly, the current support structure provides a financial incentive for farmers to cut losses by reducing the scale of the most valuable HNVF systems. A more coherent package of CAP payments focused on HNVF land could be more effective for both farmers and biodiversity conservation, with only a modest increase in funding.**

- **In Romania the current picture is more positive. Here HNVF is characterised by a very large number of small farms, and an ambitious agri-environment programme for HNV farming systems reaches more than one million hectares of HNV grassland, making up the largest share of the total CAP support at farm level. Flat rate SAPS and LFA payments create no disparity in CAP income support between HNVF and more intensively farmed land, in contrast to current SPS payments in Scotland and Spain.**

It is a very challenging task to estimate the level and type of public funding needed to support the important biodiversity resource of HNV farmland across the EU. Given the subtleties of the definition of HNV farmland and farming systems and the coarse level of data collection on CAP expenditure on specific measures in many Member States, there is insufficient data to calculate the shortfall in funding for these systems directly from agricultural data sets. The best that can be done is to devise alternative approaches to try and estimate the orders of magnitude that could be involved.

Consequently, two very different approaches have been used to estimate the scale of additional support required. Each of these methods has advantages and disadvantages and the absence of sufficiently fine-grained or complete HNVF data sets means that both necessarily involve a large number of assumptions, which are clearly set out. Both methods

use the estimates of the extent of HNVF land from this study, but otherwise are quite distinct.

One approach (in this chapter) uses data collected for this study on **farm payments** that can benefit HNVF in selected Member States. Where there are identified gaps in economic and/or land management support which pose a threat to HNV farmland, data on current expenditure has been used to estimate the cost of filling those gaps, and the appropriate mix of policy measures is discussed.

The other approach (in Chapter 9) adapts a methodology originally developed to estimate the additional costs required to implement Target 2 of the EU Biodiversity Strategy. That **ecosystem** approach is used to estimate the additional funding needed to maintain and restore identified HNVF ecosystems, but it does not consider funding required to address any underlying problems of the economic viability of the HNVF farming systems which manage these ecosystems.

At the time of writing the CAP reform legislation had not all been finalised. It should be noted that the analysis here is based on Member States' implementation the pre-2014 CAP measures, but future HNVF support will be implemented by Member States and regions within the new CAP framework and budget allocations. The options available to Managing Authorities from 2014 may differ from those analysed here. For example the ideal mix of policy measures will depend on the circumstances, and the calculations might change depending on how Member States choose to implement Pillar 1 options and what measures and what eligibility criteria they decide to use within the 2014-20 RDPs. At this stage it is impossible to take such uncertainties into account in the estimates below.

8.1 Introduction to the farm payments approach

This approach uses examples from three Member States, at different geographical scales, to illustrate the range of needs for additional CAP (or other public) support to ensure the continuation of HNV farming. The aim is to estimate the magnitude of increases required in current CAP support at farm level where it is possible to identify these. The analyses are based on sources such as broad land use data and RDP ex-post evaluations; there are many assumptions involved because the present study does not have sufficient resources to research the economic support needs of particular HNV farming systems or practices. Nor was it possible to evaluate the criteria and requirements of the many CAP measures that potentially come to bear on HNVF, or the extent to which each measure supports HNVF. Data is not readily available and considerable new research would be necessary.

The estimates here consider only area based payments to HNVF farms. There will be other CAP funding needs which cannot be estimated for HNVF farms from the data available to this study (eg 'soft measures' for capacity building, investment support in HNV farm businesses, processing and marketing).

The examples illustrate the range of situations in which additional HNVF funding is needed and estimate the additional cost of these compared to current levels of funding. They are based on an assessment of available data on current funding mechanisms and future funding needs and opportunities, specifically for:

- HNV farming in the region of Aragón in Spain;
- typical HNVF farming systems in Scotland (United Kingdom); and
- typical HNVF livestock farming systems on semi-natural grasslands in Romania.

These examples as far as possible draw on available data on current farm payments at Member State or regional level, and were prepared by case study authors familiar with the detail of HNVF in these regions. The assumptions and limitations differ for each of these calculations and are explained below.

8.2 Estimating the potential cost of HNVF support under the CAP for the region of Aragón in Spain

8.2.1 RDP assessment of HNVF in Aragón

The region of Aragón was chosen at random to see to what extent it is possible to deduce the support provided for, and potentially needed by HNVF in a Spanish autonomous region drawing on the RDP document, mid-term evaluation reports and other readily available data.

The RDP document considers HNV areas to be farmland in Natura 2000. 28 per cent of the region is under Natura 2000, of which 36 per cent consists of pastures and meadows. The RDP cites abandonment of HNVF systems in both mountain (hay meadows and pastures) and steppe (extensive arable and pastures) areas as first in a list of biodiversity threats in the region. The main need stated is to maintain traditional practices such as grazing and hay cutting. The RDP mentions that the HNVF systems are low intensity, and often of poor economic viability because the environmental goods they produce are not rewarded financially. The RDP aims to address this via environmental land management payments. However, as the following analysis illustrates, the measures in question are being applied on a very small proportion of Natura 2000 farmland.

8.2.2 Estimating current support to HNVF in Aragón

Aragón illustrates many of the difficulties in trying to analyse the current support provided to HNV farming, even at the regional level, which result mainly from inadequate data. First, there are basic problems with the land use data. There are broad categories of land use that can be considered potentially HNVF, as shown in Table 8.1.

Table 8.1: Broad categories of potential HNVF land use in Aragón

Broad category of land use	Area (hectares)
Dryland arable	1,369,706
Permanent pasture	387,879
Open forest (typically used for grazing)	262,037
Abandoned cropland available for grazing (*erial*)	964,337
Dryland permanent crops	140,445
TOTAL	3,124,404

Source: figures from official regional statistics for 2008, quoted in the RDP for 2007-13

From the land use statistics quoted in the RDP, these categories of farmland cover 3.12 million hectares. However, the UAA from the Agricultural Census also cited in the RDP is

much less, approximately 2.3 million hectares, because the UAA figure excludes large areas of pasture with trees (open forest in Table 8.1) and also of the vast area (almost 1 million hectares) of *eriales* (land of very low productivity that is out of cultivation but may be used for grazing). A critical problem is that it is not apparent from current data how much of the total area of *eriales* or of open forest is in actual extensive grazing use and therefore can be considered pasture. Thus neither of these sources provides an accurate figure of the total extent of HNV farmland in active use.

Extensive pastures of all types are a key type of HNVF in the region, but it is not clear from the data sources just how much of this land use exists. Although the land use statistics give the extent of permanent pastures as less than 400,000 hectares for the whole region, the RDP reports that within Natura 2000 alone there are 496,140 hectares of permanent pastures.

The LPIS figures for pastures in Aragón give a completely different picture. The three categories of permanent pasture eligible for CAP support (grass pasture, shrub pasture and tree pasture) totalled 1,907,260 hectares in 2005. By 2013 the figure had declined to 1,795,541 hectares, but this is still greater than the sum of permanent pasture, open forest and *eriales* from the regional land use statistics (see Table 8.1).

Table 8.2 shows the range of different figures for pastures in Aragón from three statistical sources, as well as the confusing situation with categories of land with tree cover (in some cases included in pastures, in some cases as forest with no grazing, and in some cases as forest with grazing as a secondary activity.

Table 8.2: Comparison of Aragón land-use data for pastures and forests from different sources

	LPIS	Agricultural Statistics	Agricultural Census
Total pastures	1,795,541	1,279,325	734,307
Sub-category - pasture with trees >40% cover	*373,460*	No category	No category
Sub-category - pastures with shrubs >40% cover	*1,379,050*	No category	No category
Sub-category - pastures with shrubs/trees <40% cover	*43,029*	No category	No category
Forest land with trees/shrubs/matorral (includes land with secondary use for grazing)	No category	1,468,802	No category
Forest land with trees, not used for grazing	889,389	No category	358,715

In addition to these basic land-use data issues, currently there is no readily available method or data source for distinguishing HNVF from non-HNVF within the vast area of potential HNV land in Aragón. Hence the RDP takes the view that the HNVF baseline is the farmland in Natura 2000, quoted as 830,826 hectares, of which 334,686 hectares is crops and 496,140 hectares permanent pastures. The Natura 2000 farmland area quoted in the RDP equates to 26.6 per cent of the total dryland farmland area (from land use statistics, above).

LFA payments for mountain and other areas in Aragón

The regional mid-term evaluation (Quasar Consultores, 2010) reports that the objective for uptake of the two LFA measures in Aragón[64] was 269,689 hectares; the reported actual uptake was 201,010 hectares. Approximate annual expenditure on the two LFA measures in Aragón for the period 2007-2009 is 11,533,333 euros, equating to about €57 per hectare.

The requirements of the LFA measures are not designed to favour HNVF. The eligibility criteria specify upper limits on stocking densities, but these are very high and allow for quite intensive systems. The limits are minimum 0.2 LU/ha and maximum 1 LU/ha (<800mm rainfall) or 2 LU/ha (>800mm rainfall). In contrast, the agri-environment measure for permanent pastures sets an upper limit of 1.4 LU/ha in more productive areas and a lower limit of 0.1 LU/ha in less productive areas. This illustrates an inherent tension in the CAP policy structure whereby agri-environment schemes have to be more demanding than LFA criteria in order to justify the payment, whereas from an environmental perspective it might be more logical to have just one unified measure with the lower livestock limits, provided the upper payment limits for the unified measure can accommodate the cost of all the environmental management required.

The eligibility criteria for the LFA measures also exclude many HNV farms that are below the thresholds of farm size, proportion of income from farming, etc. Thus, the positive presentation of the measure in the RDP, with its claims of very favourable effects on the environment, seems to bear no relation to the reality of the scheme's design and implementation, nor to the 2003 MTE report on the Spanish LFA measure that concluded that because of the low payments it has practically no effect on farmers' decisions or on the maintenance of farming activity[65].

Some simple criteria could be envisaged that would make the LFA measures more supportive of HNVF, such as a reduced upper limit on LU/ha, a minimum proportion of fallow in arable cropping, parcel size and presence of terraces in permanent crops. From an HNVF perspective the introduction of such farm-level criteria would constitute a far better, simpler and more efficient approach to targeting the LFA measures in favour of HNVF.

Agri-environment schemes in Aragón

The Aragón RDP includes 24 agri-environment schemes plus several sub-schemes. Of these, 14 schemes appear (from the scheme criteria) to be supportive of some aspect of HNVF. There are schemes that directly support mountain livestock (pastures and meadows) and various schemes that support some HNV aspects of dryland arable, low-intensity rice cropping and traditional permanent crops. Mosaics of arable-grass-shrub pastures may also benefit from some schemes.

The two measures for pastures and hay meadows have an uptake target of 272,800 hectares, with over 90 per cent of this target to be within Natura 2000 (the measures would thus reach about 50 per cent of the total extent of pastures and meadows within Natura

[64] There are two LFA measures are – ie one is mountainous and other is other less favoured areas.

[65] Escuela Técnica Superior de Ingenieros Agrónomos U.P.M. and Saborá Sociedad de Estudios, 2003. Evaluacion Intermedia De La Medida De Indemnización Compensatoria En Determinadas Zonas Desfavorecidas (Periodo 2000/2003)).

2000). The pastures scheme alone would cost €16,368,000 per year to execute on the target area. In practice, expenditure figures in the MTE suggest that implementation has fallen far short of the targets, with total payments of €3,781,288 per year on the two schemes. From the expenditure figures it seems that the scheme may have been taken up on <13 per cent of the area of pastures and meadows within Natura 2000 and <4 per cent of the regional total of these land uses.

The two most relevant agri-environment measures for cropland are maintenance of stubbles, which has a target to cover 25,000 hectares, all within Natura 2000 (representing 7.5 per cent of the 334,686 hectares of cropland in Natura 2000); and organic production, intended to cover 28,950 hectares of cropland (arable, rice, tree crops).

An extremely small proportion of HNVF in Aragón benefits from the various agri-environment schemes, as these uptake data and targets illustrate.

Special support under the Pillar 1 article 68 measure in Aragón
Under national implementation of Article 68, payments are made for sheep and goats in LFA of €3 per sheep (milk), €4.30 per sheep (meat), and €4.80 per goat. The 2012 budget for this measure in Aragón was reported to be €4.8 million euros. This is a similar amount to the annual expenditure on the main measures for extensive livestock under the agri-environment measure (pastures, hay meadows, rare breeds). There are no criteria attached to the payment that target it towards extensive farming systems, all farms with sheep/goats are eligible.

8.2.3 Estimating the potential Pillar 2 plus Article 68 costs of supporting all HNVF within Natura 2000 and beyond in Aragón

Only very crude estimates can be made. The estimates below take a very basic approach to estimating the funding required to maintain HNV farmland in Natura 2000 areas in Aragón and these figures subsequently are extrapolated to the rest of the potential HNVF area in Aragón.

Agri-environment support
A very basic approach to estimating the scale of funding needed by HNVF in Aragón would be to calculate the budget required to implement the current pastures/meadows schemes, the maintenance of stubbles scheme and the organic arable scheme on all farmland within Natura 2000. These three agri-environment schemes do not seek to deliver tightly defined habitat management through high payments on limited areas of land, rather they can be considered as basic payments that reward the continuation of the main HNVF systems in the region. Therefore it is a reasonable policy aspiration for all farmland under such systems to receive these basic agri-environment payments, at least within Natura 2000 areas. If it is assumed that the ratio of meadows to pastures is as indicated by the target areas for the two measures, then within Natura 2000 there would be 19,846 hectares of meadows and 476,295 hectares of pastures, requiring the following annual agri-environment budgets:

Pastures 476,294 x €60	= €28,577,640
Meadows 19,846 x €109	= €2,163,214
TOTAL	= €30,740,854

Cropland in Natura 2000 covers 334,686 hectares in total in Aragón. It is not possible to determine how much is arable cropland and how much is permanent crops, but at regional level the proportion is about 10:1. If it is assumed therefore that the arable area within Natura 2000 is approximately 300,000 hectares and an agri-environment payment of €60 per hectare (the stubbles scheme and organic cropping in low-yielding land pay approximately the same amount), then the required annual budget would be €18 million

For permanent crops, the assumption above is that there are approximately 30,000 hectares of these crops within Natura 2000. It is not known what proportion are olives or other types of fruit or nut trees. The average agri-environment organic payment for olives/fruit/nuts works out at €193 per hectare. If we assume this payment on 30,000 hectares the budget would be €5.8 million.

For the other agri-environment measures relevant to HNVF we have assumed a budget the same as in the current RDP, as these are measures that are not designed for blanket support of HNVF systems but rather for more targeted actions, such as grazing certain habitats with horses or sowing parcels of sainfoin in arable landscapes. There is no information on which to base an alternative target area/budget to the one in the RDP.

Thus we arrive at a very approximate agri-environment annual budget requirement for HNVF within Natura 2000 in Aragón of €56 million. This compares with annual expenditure on the HNVF-relevant schemes of €8.6 million currently. The predicted total agri-environment expenditure in the regional RDP is €22 million per year, but it is important to note that this includes several schemes that are for intensive cropland, not HNVF.

LFA (ANC) payments

For the purposes of these calculations it was assumed that HNVF land also needs to receive LFA payments in order for the farm to be viable, as almost all HNVF land is within the LFA. Currently the regional MTE data implies that, although uptake of LFA payments against RDP targets is reasonable, only around 20 per cent of LFA land actually receives LFA payment, because of the restrictive eligibility criteria applied in Spain. If it is assumed that this proportion of payment coverage is the same within Natura 2000 as overall, then the current expenditure at €57 per hectare would be €9,471,416 within Natura 2000. To extend such payments to achieve 100 per cent coverage at the same per hectare rate would require €47,357,082. Annual LFA expenditure according to the MTE has been €11.5 million to date.

Finally 26.6 per cent of the current budget for the Article 68 measure to support sheep and goats is calculated as this is the area of Natura 2000 farmland as a proportion of total dryland farmland (the focus of one of the relevant Article 68 measures). The budget for the Article 68 measure for suckler cows in Aragón is not known so has not been included.

Thus to achieve full agri-environment, LFA and Article 68 (sheep/goats) support for pastures/meadows, arable (excluding rice) and permanent crop land within Natura 2000 in Aragón would require approximately €105 million per year. As an average amount for the farmland within Natura 2000 this equates to €127 per hectare. Current annual expenditure on the same measures within Natura 2000 is very approximately €19 million or an average of €23 per hectare.

For a potential HNVF area of very approximately three million hectares in Aragón, full coverage by the same payments would require a ball-park annual budget in the region of €380 million (15 times the current expenditure for these measures at regional level of €25 million). This compares with an annual Pillar 1 budget in the region of €441 million (2012). See Table 8.3 for details of these estimates.

8.2.4 To what extent would a flat-rate Pillar 1 payment favour HNVF in Natura 2000?

It is interesting to consider if a redistribution of the Pillar 1 budget (currently distributed on an almost entirely historic basis) would achieve a certain amount of the HNVF support needs, without depending so heavily on Pillar 2. In present Spanish economic circumstances in particular, the need to find co-financing for Pillar 2 expenditure is a major block to its use.
The average value of current SPS rights in Aragón is €319 per hectare. However, farmers with extensive farming systems generally have rights of far lower value due to the historic basis of the payment calculations. For example, a study in Extremadura in 2005 estimated the Pillar 1 support received by low-yielding arable land with a large proportion of fallow at about €40 per hectare, compared with approximately €600 per hectare for irrigated maize. Rice also receives a very high payment and is present in Aragón. Support for extensive grazing land was calculated at typically between €50 per hectare and €150 per hectare, with the lower support going to land with sheep/goats and the higher support to land supporting suckler cattle.

The additional support provided by agri-environment and LFA payments in the above estimates equates to €120 per hectare for pastures and arable land, and €170 per hectare for hay meadows. This is in addition to Pillar 1 support for such land that probably ranges from less than €50 per hectare to a maximum of maybe €150 per hectare (eg for better pastures with suckler cattle). Thus for much of HNVF, a change from historic SPS payments to a regional flat-rate model paying €319 per hectare would provide at least the additional support potentially provided by agri-environment and LFA, and in many cases more, but without the possibility of requiring HNVF land management as a condition of the payment.

The costs of Pillar 1 payments on the flat-rate regional model for Natura 2000 farmland alone would be €265 million. This compares with an annual Pillar 1 budget in the region of €441 million (2012).

Extrapolating the flat-rate payment of €319 to the total dryland farming area of three million hectares requires a budget of €957 million more than double the current Pillar 1 budget in the region. This illustrates three crucial considerations: a) most dryland farmland receives very much less than €319 per hectare under the current regime; b) the land use statistics do not provide an accurate figure for the extent of farmland in active use, and the figure of three million hectares is undoubtedly an over-estimate; and c) there are significant areas of farmland that do not have SPS rights under the current regime (total rights per hectare claimed are 1.38 million hectares, or one million hectares less than the official UAA of the region).

8.2.5 Conclusions from the Aragón example

The calculations presented above are extremely approximate and make many assumptions that potentially could be checked and refined given more time and resources. Nevertheless the example illustrates several points:

- Current data sets provide a very unclear picture of the true extent of HNV grazing land in actual use. This could be corrected if farmers declared all the land they use in IACS.
- Reporting to the EC on overall agri-environment expenditure for a region, as currently occurs, reveals almost nothing about the extent to which HNVF is being supported. Analysis of up-take of specific agri-environment schemes is essential, but this is not reported to the EC.
- There are several agri-environment schemes in the RDP that seem potentially positive for providing broad support to the main HNVF systems in the region. However, the scale of implementation is extremely limited, even within Natura 2000. For example, the schemes for pastures and hay meadows appear to have been taken up on only about 13 per cent of these land uses within Natura 2000 and less than four per cent of the regional total. The LFA/ANC measure also only affects a relatively small proportion of HNVF, due to restrictive eligibility criteria applied in Spain.
- A very approximate agri-environment annual budget requirement for HNVF within Natura 2000 in Aragón is estimated at €56 million. This compares with annual expenditure on the HNVF-relevant agri-environment schemes of €8.6 million under the current RDP to 2010.
- To achieve full agri-environment, LFA/ANC and Article 68 (sheep/goats) support for pastures/meadows, arable (excluding rice) and permanent crop land within Natura 2000 in Aragón would require approximately €105 million per year. As an average amount for the farmland within Natura 2000 this equates to €127 per hectare. Current annual expenditure on the same measures within Natura 2000 is very approximately €19 million or an average of €23 per hectare.
- A change to a regional flat-rate Pillar 1 model in the region would pay €319 per hectare on all farmland currently receiving support. This would provide HNVF with at least the additional support potentially provided by extending agri-environment and LFA to all HNVF, and in many cases more.
- The costs of Pillar 1 payments on the flat-rate regional model for Natura 2000 farmland alone would be €265 million. This compares with an annual Pillar 1 budget in the region of €441 million (2012).

To improve support for HNVF in the region, and transparency of this support, we could consider the following changes to policy at EU, national and regional levels:

- All HNVF should be eligible for Pillar 1 support and LFA support. This requires a change to eligibility criteria and an improvement to data sources including LPIS, with accurate recording of the extent of farmland actually in extensive grazing use.
- All RDPs should provide a simple HNVF support scheme available for all HNVF. Achieving 100% coverage of HNVF within Natura 2000 should be the first priority, so a sufficient budget should be allocated to achieve this, as well as sufficient resources for outreach to farmers to ensure up-take.
- All RDPs should explain which measures are supporting HNVF and how, and explain what proportion of total HNVF will be supported in the region.
- In Aragón this support could be through an improved LFA scheme with basic HNVF requirements, more open eligibility and higher payments; through considerable expansion of the agri-environment schemes that currently exist; through Article 68; or a combination of all these.

- Given that co-finance is a major barrier to expanding use of Pillar 2 in Spain, the better approach could be to create an HNVF support scheme using Pillar 1 funds under an Article 68 type approach, as in Ireland. This should have a simple application procedure as does the LFA scheme, and basic HNVF requirements for each HNVF type (eg minimum and maximum grazing pressure for pastures, understorey in olive groves, proportion of fallow in arable systems).
- To provide HNVF support for Natura 2000 farmland alone (assuming similar support to currently possible from Pillar 2 plus Article 68) would require a 5.5 times increase in expenditure on Natura 2000 farmland compared with the current situation, from €23 per hectare to €127 per hectare. This compares with an average Pillar 1 expenditure in the region of €319 per hectare.

Table 8.3: Estimating future HNVF support costs in Aragón

CAP funding measure	Payment rates €/ ha	Target / achieved	HNVF systems supported	Average annual total public expenditure (EU +national/regional) on this support €	% of HNVF land (or farms or farmers) in this system that benefit from this support	Estimated annual budget needed for farmland within Natura 2000 €	
						PILLAR 2 + Art 68	PILLAR 1
Agri-environment 214 [all schemes]	see subsequent rows for each scheme	see subsequent rows	see Chapter 10	18,147,711 (objective was 21,980,000 per year)			
214 Maintenance of grazing on pastures and rough grazing	60 / ha	262,300 ha / NA	mountain livestock, grass and shrub steppes	3,024,970	objective is about 55% of the extent of pastures and meadows within Natura 2000. As a % of all extensive pastures and meadows in the region it is closer to 15%. However, up-take of the measure to 2012 seems to be less than a quarter of the RDP objective.	28,577,640	
214 Maintenance of hay meadows in mountain areas	109 / ha	10,500 ha / NA	mountain livestock	756,318	total extent of HNVF hay meadows not available	2,163,214	
214 Maintenance of native breeds in danger of extinction	121 / LU	5,000 LU / NA	mountain livestock, grass and shrub steppes	445,026	<1% of total HNVF extensive livestock systems		
214 Extensive horse grazing in natura 2000	120 / ha	500 ha / NA	mountain livestock	53,170	<0.1% of total HNVF extensive livestock systems		
214 Maintenance of grazing on stubbles	not specified in RDP	not specified in RDP	dryland arable	812,425	impossible to calculate		
214 Maintenance of stubbles	60 / ha	35,000 ha / NA	dryland arable	1,648,656	objective is 10% of the arable area within natura 2000	18,000,000	
214 Cultivation of sainfoin to maintain steppe fauna	82 / ha	8,000 ha / NA	dryland arable	410,492	objective is 2.4% of the arable area within Natura 2000	410,492	
214 Organic agriculture dryland arable	1.5t/ha = €56/ha (much higher for irrigated)	25,000 ha / NA	dryland arable	898,279	objective is 7.5% of the arable area within natura 2000	898,279	
214 Organic rice cropping	411 / ha	350 ha / NA	low-intensity rice	79,035	impossible to calculate	79,035	
214 Organic nuts and fruit dryland	119 / ha	1,500 ha / NA	traditional permanent crops	113,482	objective is 1% of total dryland permanent crops in the region	5,790,000	
214 Organic olives	267 / ha	2,100 ha / NA	traditional permanent crops	352,579	objective is 1.5% of total dryland permanent crops in the region		
ALL HNVF-RELEVANT 214 AE SCHEMES				**8,594,431**		**55,918,660**	

CAP funding measure	Payment rates €/ ha	Target / achieved	HNVF systems supported	Average annual total public expenditure (EU +national/regional) on this support €	% of HNVF land (or farms or farmers) in this system that benefit from this support	Estimated annual budget needed for farmland within Natura 2000 €	
						PILLAR 2 + Art 68	**PILLAR 1**
LFA 211 and 212	average expenditure €57 / ha [min 300 per holding max 3000 per holding]	Total designated area = 980,000 ha Objective for up-take of measure = 269,689 ha Actual up-take = 201,010 ha	All HNVF systems may be supported to some extent, with possible exception of rice (not known if within LFA).	11,533,333	up-take area of 201,000 ha is equivalent to 24% of farmland within Natura 2000 (though not all up-take is within Natura 2000) and <7% of total potential HNVF in the region	47,357,082	
A68 aid for sheep/goats in LFA	€3/sheep (milk), €4.30/sheep (meat), €4.80/goat	Unknown	Mountain livestock, grass and shrub steppes, mosaics of arable-grass-shrub pastures, *dehesa*, dryland arable	4,800,000	Impossible to calculate	1,276,800	
A68 aid to compensate special disadvantages of suckler cow producers	unknown	Unknown	Mountain livestock	unknown	impossible to calculate		
SPS	average value of an SPS entitlement (= hectare) is €319 compared with €286 at national level	1.38 million SPS rights claimed	All HNVF systems benefit to some extent from SPS, although payments received per ha are generally much lower than for intensified systems	440,638,396 (2012)			265,033,494
ALL HNVF-RELEVANT measures						**104,552,542**	**265,033,494**

8.3 Estimating the potential cost of HNVF support under the CAP for Scotland in the UK

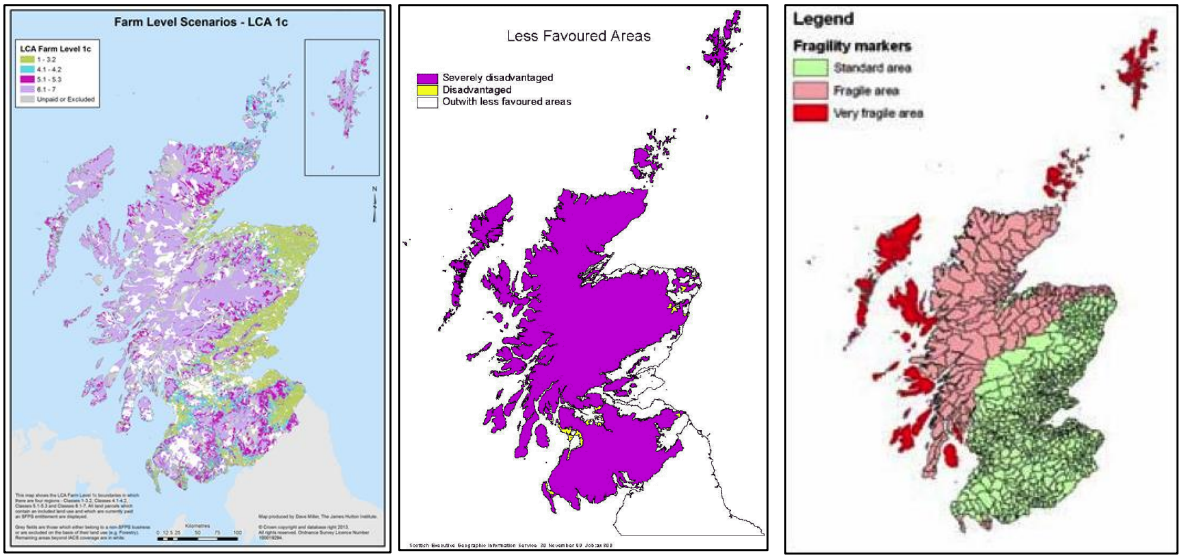
This section assesses the potential costs required to support HNV farming systems as the main land use on agriculturally marginal hill land in Scotland. To do this it considers the extent to which the current structure, distribution and scale of CAP area based farm payments provide the support needed for these HNV farms.

8.3.1 HNV farmland in Scotland

It is estimated that more than 74 per cent of the UAA in Scotland consists of semi-natural, HNV pastures. These are dominated by wet and dry acid grasslands, wet and dry heaths and blanket bog in the most marginal and agriculturally unproductive areas of Scotland within the two lowest agricultural Land Capability Classes[66]. Almost all of this land also lies within the Severely Disadvantaged Area of the LFA, and much of it is within 'fragile' of 'very fragile' areas defined by distance from markets and land disadvantage[67] as shown in Figure 8.1 The extent of these semi-natural HNV pastures is around 3 million hectares (it is estimated that at least 2,913,000 hectares are managed under low-intensity livestock systems[68], and there are 3.1 million hectares in the most marginal land classes of the LFA).

These low-intensity HNVF livestock systems, which are described in more detail in section 5.3, are based on rearing sheep and cattle at stocking densities generally below 0.3 LU/ha, to produce lambs and suckler calves for sale to farms on better agricultural land for fattening or as breeding stock.

Figure 8.1: Land capability, LFA area and 'fragility' of farmland in Scotland



Source: James Hutton Institute, Scottish Government.

[66] Of the 3.1 m ha of HNVF, 0.8 million ha are of the lowest agricultural quality (LCA 5.1-5.3) and 2.3 million ha are in LCA 6.1-7 (the least productive land of all).

[67] There are three categories: *standard* and *fragile* on the mainland *very fragile* on the Scottish islands (Scottish Government, 2013).

[68] EFNCP estimate drawing on government environmental and agricultural data sets (UK case study).

8.3.2 The cost of maintaining HNV farming in Scotland

As the analysis of farm business income for an HNV livestock farm in NW Scotland has shown (section 5.3) that these farming systems are uneconomic and do not provide an adequate return on family labour and capital. A suckler cow enterprise with a stocking density of 0.18 LU/ha makes an annual farm business loss of €65 per hectare, and a sheep enterprise with a stocking density of 0.15 LU/ha makes an annual farm business loss of €50 per hectare, before decoupled CAP support payments are taken into account.

On the basis of these figures, it is possible to estimate that the total farm business loss from continuing to farm the 3 million hectares of extensively-managed HNV farmland in the LFA in Scotland is of the order of €150-195 million per year. This represents the current estimated annual 'cost' of maintaining HNV farming in Scotland and, as the calculation in section 5.3 shows, much of this cost is borne by the HNV farmers themselves.

8.3.3 Estimating current CAP payments to HNVF farming systems

In Scotland almost all HNV farmers, including those grazing common land, are eligible for both SPS and LFA payments. Only some HNV farmers benefit from agri-environment payments. The Natura 2000 compensation measure is not used in Scotland.

SPS payments

SPS payments are fully decoupled and currently calculated on a farm-by-farm historic basis. There is limited arable cropping In Scotland so pre-2005 Pillar 1 support had been mostly in the form of headage payments for sheep and beef cattle, which were translated into SPS payments for that farm. The sheep and beef farms with agriculturally improved non-HNV grassland had higher historic stocking densities in the 2000-02 reference period than the low-intensity HNV farms with semi-natural pastures, and these more intensive livestock farms now have higher SPS payments per hectare than the HNV farms. Typical current SPS payments for the HNVF land can be estimated using historic LFA payment rates and stocking density data from 2004 for farmland in the three different fragility zones (Table 8.4).

Table 8.4: Stocking density in Scotland by fragility class

	Standard (includes non LFA land)	Fragile	Very Fragile
Livestock (LU)	654,000	213,000	149,000
Forage area (ha)	1,571,000	1,195,000	632,000
Stocking density (LU/ha)	0.42	0.18	0.24

Source: own calculation using 2004 data from Scottish Government (2005).

All of these 'fragility' classes include significant areas of better quality farmland, so the stocking density of 0.18 LU/ha is used here to represent the historic stocking rate on HNV land during the reference period for SPS calculation. Taking this stocking rate and the average SPS payment after modulation[69] of approximately €24.52 per hectare for suckler cow farms and €20.50 per hectare for sheep calculated for the example in section 5.3, it is possible to estimate that SPS expenditure on HNV, semi-natural farmland is between €61.5

[69] The UK applies additional voluntary modulation transfers from Pillar 1 to Pillar 2. For this calculation the combined rate for Scotland in 2013 is assumed to be 20 per cent.

and €73.6 million per year[70]. This represents around 12 per cent of Scotland's annual SPS budget of €559 million[71] to the 66 per cent of the UAA that is managed by rough grazing dominated farms.

LFA payments

In marked contrast to England and Wales, which have phased out LFA payments completely, Scotland allocated a much greater share of its 2007-13 RDP budget to LFA payments than to agri-environment (23 per cent compared to 13 per cent). Before 2005 LFA payments had been headage based and were then converted into area based payments in a way that largely reflects former stocking density. There is a baseline requirement for LFA payments of a minimum stocking rate of 0.12LU/ha (less than one sheep per hectare) and Scottish administrations have tried to differentiate LFA payments to reflect to a certain extent the HNVF value of farms with historically low stocking rates and mixed suckler cow and sheep systems, as well as to reflect the 'fragility' of livestock farming in different parts of the country. Coefficients are applied to the calculation of a farm's LFA payment to reflect these factors, but by far the most powerful determinant of every LFA payment in Scotland is another coefficient linked directly to the historic stocking density on the land more than 10 years ago. Each parcel of LFA land has a fixed 'grazing value', originally based on the stocking density on the land in the year 2001 (Table 8.5). This means that when LFA payments were decoupled from production the highest LFA payment rates per forage hectare were allocated to the most agriculturally productive LFA farms, just as with SPS (illustrated in Figure 8.2). At intervals the Managing Authority in Scotland carries out 'rebasing' exercises for LFA payments. If current stocking density is found to outside the LU/ha limits of the historic 'grazing value' allocated to that land it will be 'rebased' to a lower/higher 'grazing value' band and the farm's LFA payment will change. In effect this is a form of *de facto* coupling to current production because the risk of losing LFA payments through 'rebasing' discourages LFA farmers with more intensive livestock systems from extensifying their livestock farming. HNVF farmers are already likely to be in the lowest 'grazing value' band.

Table 8.5: Differentiated LFA payments in Scotland (€ per forage hectare)

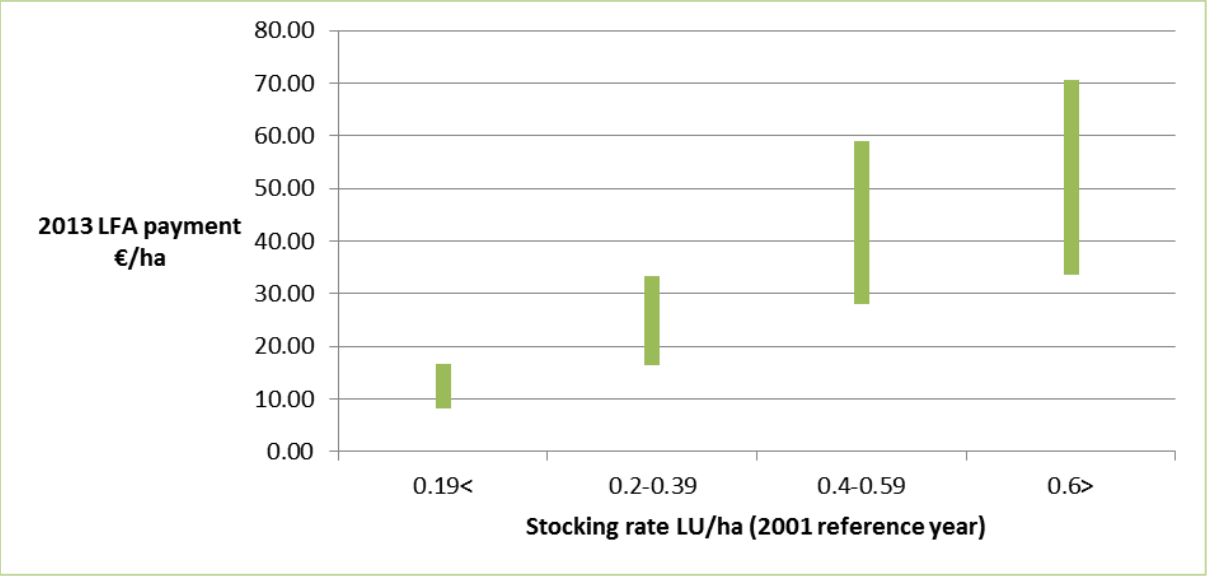
	Fragility index	Standard			Fragile			Very fragile		
	% cattle	<10%	10-<50%	≥50%	<10%	10-<50%	≥50%	<10%	10-<50%	≥50%
'grazing value' linked to historic stocking density LU/ha	≤0.19	8.14	11.03	13.91	9.40	12.66	16.04	9.77	13.28	16.67
	0.2-0.39	16.29	21.93	27.69	18.80	25.31	31.95	19.67	26.44	33.33
	0.4-0.59	27.94	37.84	47.62	32.96	44.61	56.14	34.71	46.86	59.02
	≥0.6	33.58	45.36	57.14	39.60	53.51	67.29	41.60	56.14	70.67

Source: Scottish Government (2013)

[70] CAP payments and other farm business data for the United Kingdom in this report have been converted to € using the conversion rate of 0.79805 which applies to SPS payments in the United Kingdom in 2013).

[71] http://news.scotland.gov.uk/News/Farmers-receive-vital-funding-6af.aspx

Figure 8.2: LFA payment rates in 2013 (€ per forage hectare)



Source: own compilation based on payment rates in Table 8.5

If HNV farming systems are assumed to have had an historic stocking density in the 2001 reference year of no more than 0.19 LU/ha (placing them in the least intensive category of 'grazing value' for LFA payments) their LFA payment rates per forage hectare now will vary between €8.14 and €16.67 depending on the historic proportion of cattle and the fragility class. As sheep outnumber cattle an average LFA payment of €12.5 per HNV forage hectare has been used here to estimate that the total annual LFA expenditure on HNV semi-natural farmland is €38 million in LFA payments. This is approximately half of the annual LFA expenditure[72].

Agri-environment payments

The 2007-13 RDP has two menu-based schemes, the main agri-environment scheme Rural Priorities with a total expenditure of €26 million per annum and the entry-level Land Managers' Options scheme, which is not confined to agri-environment measures, with an expenditure of €11 million per annum. These agri-environment payments are discretionary and although some HNV farms undoubtedly benefit from habitat specific payments others with similar HNV farming systems do not. Jones (2012) illustrated that uptake of agri-environment payments is comparatively poor in parishes dominated by semi-natural vegetation, where a significant proportion of farms are likely to be HNV. If the sample used in that study, with 458,604 hectares of forage receiving (at that time) a total of about €3 million annually in agri-environment payments from the current RDP, is extrapolated to the whole three million hectares of potentially HNV land in Scotland, roughly €19.6 million would need to be spent annually from the agri-environment budget of the *current* RDP (ie excluding legacy schemes from previous RDPs). Most of these payments are calculated on the basis of costs or income foregone over and above the normal farm economy, and should therefore not be set against the loss made in the basic farming enterprise(s).

[72] http://www.scotland.gov.uk/Publications/2011/10/04153155/15

8.3.4 Conclusions from the Scotland example

The above estimates suggest that the HNV farmers in Scotland receive around €128 million of public funds per year in SPS and LFA payments (€90m and £38m respectively) to set against an estimated total HNV farm business loss of over €188 million. In addition, it is estimated that of the order of €19.6 million of 'targeted' agri-environment expenditure is directed to the same region. The suckler cow farmers also benefit from Article 68 special support payments for beef calves, which have already been accounted for in the farm business income calculations (section 5.3).

There are two conclusions to be drawn from this analysis. The first is that, although the total expenditure on this 'core' HNV area of around 3 million hectares of semi-natural pastures is insufficient to provide these HNVF farmers with an income, leaving a shortfall of at least €63 million and possibly much more, support levels do not need to change by many orders of magnitude for HNV farmers to be adequately rewarded for their efforts (for example to receive the equivalent of the minimum wage for their labour and a return on their capital). The second conclusion is that, although SPS payments currently provide a very high proportion of total CAP payments to these farms they also act as a strong perverse incentive for the farmer to reduce costs by reducing livestock numbers or adopt 'minimal farming'[73]. As currently structured, HNVF farmland receives the lowest per hectare LFA payment rates. Although the LFA measure is expected to address the Pillar 2 strategic priority of the continuation of HNV farming systems, in Scotland the payments are in practice only very weakly linked to supporting HNVF farming systems.

The key to effective and efficient use of CAP funding for HNVF in Scotland in future lies in ensuring that the totality of the package of *all* CAP payments reaching the HNVF farms incentivises the most valuable HNV farming systems. This means ensuring that the most economically rational decision for the farmer is to operate HNVF low-intensity systems with a proportion of suckler cattle. The alternatives of sheep-only systems, 'minimal farming' or CAP-funded tree planting on marginal pastureland will risk damage or deterioration of the characteristic semi-natural HNV habitats of Scotland. There are several possibilities to refocus CAP expenditure on HNVF farming systems dependent on semi-natural upland pastures in this way. For example, these might include some combination of structured regionalised payments for SPS, transfers from Pillar 1 to Pillar 2, coupled payments for suckler calf systems and reallocating part of the LFA budget to the agri-environment budget to increase the opportunity to target agri-environment support at HNVF.

8.4 Estimating the potential cost of HNVF support under the CAP for semi-natural grasslands in Romania

8.4.1 HNV farmland in Romania

Semi-natural grasslands are the main type of HNV farmland in Romania, managed by HNV whole farm systems including low-intensity dairy farms using traditional hay meadows and extensive sheep grazing systems on open pastures. The great majority of permanent grassland in the country is still under traditional, low-intensity management and all

[73] Where farmers reduce farming activity or land management to the minimum level required to enable them to continue to be eligible for Pillar 1 decoupled income support payments.

permanent grassland and orchards with a grass understorey can be considered HNV grasslands. For simplicity, the following estimates take into account only HNV grassland, not Type 3 HNV farmland and arable areas of Type 2 HNV (although in practice Type 2 farming systems are mixed and these mosaics will benefit from the grassland payments).

A simple estimate of the total HNV grassland area would be the sum of all permanent grasslands and orchards with a grass understorey. The total national UAA is 14.7 million hectares, of which 23 per cent is pasture, 10 per cent hay meadow and 1 per cent orchards with grass understory. So an estimate of 30 per cent of UAA, or 4.4 million hectares is a reasonable approximation of the total area of HNV grassland. The RDP gives the total HNV grassland area is 3.32 million hectares, but this is the area of permanent grassland in municipalities that have more than 50 per cent permanent grassland cover and can be considered a subset of the total HNV grassland area in Romania.

Small farm size is a critical factor in delivering effective CAP support in Romania because 3.1 million hectares, 21 per cent of the UAA[74], is farmed by 1.04 million holdings ranging in size from one to 10 hectares. A further five million hectares of farmland is in the 2.7 million holdings of less than one hectare in size but these holdings are not eligible for CAP support. These are excluded from SAPS, unless they form an association with a single claimant.

8.4.2 Estimating current support to HNV grasslands in Romania

The estimates below are for the main payments per hectare of farmland from SAPS, mountain LFA and agri-environment payments, and do not include other forms of CAP support, such as investment aid under Pillar 2. The maximum possible payment per hectare from all these sources is €387, but this must be seen in the context of the very small farm size of many HNV farms.

It is assumed that only 73 per cent of HNV grasslands currently receive SAPS, because the other 27 per cent of HNV grasslands do not meet eligibility criteria, such as the minimum farm size of one hectare[75]. The SAPS payment in 2013 is €117 per hectare (this will increase slightly in future years), giving a total current SAPS expenditure of €284m (3.32 m ha x 73% x €117 per hectare).

Mountain LFA payments are significant for HNVF grasslands because 95 per cent of the mountain LFA area coincides with the HNV grassland area identified in the RDP. A total of 1.87 million hectares received the mountain LFA payment[76] of €100 per hectare, giving an estimated total of €178 million LFA expenditure on HNVF.

Romania has implemented an ambitious HNVF agri-environment programme within the 2007-13 RDP to support the continuation of traditional HNV farming systems on grasslands. There are two complementary schemes for low-intensity management of the current HNV

[74] Source Agricultural Census and APIA Payments Agency data 2011, quoted in Otiman, P.I., (2011) *Romania's Present Agrarian Structure*, Institute of Agricultural Economics, Romanian Academy,

[75] ADEPT experience from one large Natura 2000 site indicated that 27 per cent of HNVF grasslands were not eligible for SAPS.

[76] Source: *Raport Anual de Progrese privind Implementarea PNDR in Romania in anul 2012* (RAPIP), Ministry of Agriculture and Rural Development (MADR) Romania.

grassland systems[77]. Scheme 1 has a payment rate of €124 per hectare for basic grassland management; Scheme 2 supports non-mechanised HNVF management of the grassland with an additional payment rate of €58 per hectare to reflect the higher labour requirements. Uptake is high and a total of 2.173 million hectares of grassland benefit from these two schemes (1.23 million hectares and 0.943 million hectares respectively[78]). Using these uptake and payments rates, total current expenditure on HNVF agri-environment schemes is estimated at €170.15 million (Scheme 1: 1.23 m ha x €124/ha = €152.5m; Scheme 2: 0.943 m ha x €58/ha = €54.7m).

Therefore estimated current annual expenditure on HNVF grassland from the main CAP payments is:

SAPS	€284m
LFA (mountain)	€178m
Agri-environment	€207m
Total	**€669m**

8.4.3 Estimating the CAP funding needed to support all HNV grasslands in Romania

The biodiversity value of the HNVF grasslands of Romania depends on landscape scale low-intensity farming in small, labour intensive units using entirely HNVF farming systems, which provide a significant source of rural employment. The HNVF examples below of a sheep farm and a cattle farm, illustrate that around half the farm income comes from CAP support, totalling €299 per hectare for the sheep farm and €151 per hectare for the cattle farm. Agri-environment payments form the major part of both.

The farm-based approach taken assumes that HNVF farms need to meet an income target of at least €10,000 per AWU of farm family labour, equivalent to €5.21 per hour (this does not take into account provision of a return on capital invested in land and livestock). The sheep farm example already attains this with CAP support of almost €300 per hectare on its 27 hectares of owned or leased land (and if SAPS were claimed on the 170 hectares rented from the town council this would provide an extra income of up to €19,890 a year (depending on how much the rent went up), taking the income per AWU to possibly as high as €26,000/AWU. In contrast the smaller but more labour intensive cattle farm would require CAP support of around €190 per hectare (€10,000 - €3968 production income/ 32 ha) to achieve this threshold. These theoretical extrapolations illustrate the importance of degressivity in area based payments to provide effective support for HNVF farms, when small farms require relatively high payment rates per hectare.

ADEPT has calculated that an 'average' HNV low-intensity dairy farm of 5 hectares using traditional hay meadows to meet an income target of €10,000 per AWU needs support payments of €320 per hectare. The assumption that all HNV grassland farms need €320 per hectare is a crude assumption, based on costs for dairy cows using traditional hay meadows. Some other HNV grassland farming systems (larger, all-grazing sheep systems for example) could be viable with a smaller payment per hectare.

[77] Requirements for both include: no artificial fertilisers, FYM less than 30 kg N/ha. Meadows must be mown at least one per year, after 1 July. Pasture grazing less than 1 LU/ ha. No ploughing, rolling or reseeding.
[78] Source: RAPIP *op.cit*.

Using this target income figure applied to the two estimates of total HNV grassland area it is possible to calculate the order of magnitude of increase required in current expenditure as follows:

- **For the RDP designated HNV grassland area of 3.32 million ha**, the total needed would be: 3.32 m ha x €320 = €1,062 million **equivalent to current expenditure x 1.68.**
- **For upper estimate of HNV grassland area of 4.41 million ha**, the current SAPS on this area is estimated at 4.41 x 73% x €117 = €377m, spend on Pillar 2 payments is as above (actual area paid), giving a total current spend of €725.15m. The total needed would be 4.41 m ha x €320 = **€1411.2 million, equivalent to current expenditure x 2.23.**
- A much more accurate estimate could be made by dividing HNV farms into several categories according to broad farming system and farm size. This may be possible to do but requires more resources than were available to the present study.

Romanian sheep farm example

The farm family manages 750 sheep and 550 lambs on almost 200 hectares. They own 50 of the sheep and 150 of the lambs; the rest of the livestock are kept on behalf of other villagers, who receive part of the farm produce in return. Half the farm's income comes from lamb sales. The farmer owns seven hectares and has a long lease on a further 20 hectares, on which he can claim SAPS. The remaining 170 hectares are rented annually from the local town council and he currently receives no SAPS payments on these[79]. Labour is provided by the family (1.4 AWU) and four employees for six months per year (2 AWU).

	Area hectares	Income
Farm income		
Farm size	27	
UAA	27	
Off-farm grazing	170	
Total HNV permanent grassland	197	
LU/ha	0.87	
Production net income		€8457
Current CAP support on 27ha owned or long leased land (SAPS at €117/ha and HNV grassland agri-environment payments of €124 + €58 /ha)		€8073
Total farm income		**€16530**
CAP support per hectare (on 27 ha)		**€299**
Return on farm family labour		
Hours worked by family		2880 (1.4 AWU)
Income per family AWU from production		€6040
Income per family AWU from CAP support		€5766
Total income per hour of family labour		**€5.74**

[79] This is likely to change, as town councils can no longer receive SAPS payments and are likely to increase rents, but by no more than 30 per cent.

Romanian cattle farm example

The cattle farm keeps 7 cows and 5 followers on 30 hectares of land, 6 hectares of meadow and 2 hectares of arable land owned by the farmer and 24 hectares of grazing rented from the Town Hall. It is assumed that all 32 hectares are eligible for CAP support. The cows produce an average of 2800 litres of milk per year, two litres are kept back each day for personal use, which has been accounted for in the budget, and the rest is sold to the village Milk Collection Point.

	Area hectares	**Current income situation**
Farm income		
Farm size	8	
UAA	8	
Off-farm grazing	24	
Total HNV farmland area	30 (plus 2 ha arable)	
LU per hectare	0.31	
Production net income		€3968
Current CAP support (SAPS at €117 on 32ha, and HNV grassland agri-environment payments €124 + €58 on 6 ha)		€4836
Total farm income		€9244
CAP support per hectare (on 32 ha)		€151
Return on farm family labour		
Hours worked by family		1920 (1 AWU)
Income per family AWU from production		3968
Income per family AWU from CAP support		4836
Total income per hour of family labour		**€4.80**

8.4.4 Conclusions on the Romanian example

Romania has implemented a very successful HNVF agri-environment programme carefully designed to support the continuation of highly valuable HNVF farming systems. This now reaches 1.23 million hectares of HNVF grassland in Romania. At farm level the agri-environment payments are the largest share of the CAP support package, helping to reduce the risk of intensification or 'minimal farming'. It is also significant that the HNVF farming systems are an integral part of village life and employment. As Romania's economy develops there will almost certainly be a need to keep agri-environment payments for these HNVF systems under review to ensure that they keep pace with rising opportunity costs of both labour and land.

8.4.5 Conclusions from the three examples

These three examples from different Member States show that it is very difficult to estimate current expenditure on HNVF, and even more difficult to estimate the expenditure that is required to support all existing HNVF. The three cases also illustrate quite different situations, both in terms of farming patterns and policy implementation. The calculations used in each example follow different approaches and are not comparable with each another.

Within each country/region, there is also a range of different HNV farming situations, and their support needs vary. Some HNVF systems have greater economic viability than others. Very small holdings normally require a higher level of payments per hectare. The study did not have sufficient resources to analyse the support needs of individual HNVF systems, but such analysis could help to inform future policy development.

Overall Romania seems to have a considerably more favourable policy package for HNVF than Scotland or Aragón. This starts with Pillar 1. SAPS is paid on a flat rate in Romania, at a rate of €117 per hectare in 2013. This compares with a typical SPS support rate received in Scotland and Spain on extensive grasslands of around €25-50 per hectare (depending on the variations within the historic SPS system). For specific livestock systems in Scotland and Spain there is some additional support through Article 68 schemes.

LFA payments are also paid at a standard rate in Romania whereas in Scotland they are weighted in favour of the better LFA land and in Spain they are caped at a very low level, so that the payment per hectare in Romania of €100 per hectare (before applying degressivity criteria) can be as much as 10 times higher than payments in Scotland in the case of the poorest land, and is also much higher than in Spain.

In addition, agri-environment payments in Romania are considerably higher than in Spain for HNVF grassland and have been implemented over a much larger area than in Scotland and Spain. In Romania approximately 65 per cent of the 3.32 million hectares of HNVF grasslands identified in the RDP are signed up already to the agri-environment support scheme. In Aragón the equivalent schemes for pastures and hay meadows appear to have been taken up on only about 13 per cent of these land uses within Natura 2000 (a subset of regional HNVF).

Romanian HNVF is especially characterised by a very large number of small farms, and these generally need higher payments per hectare in order to be viable. Nevertheless it is striking that HNVF is so well supported in Romania in comparison with more intensively farmed land, whereas in Scotland and Spain HNVF receives a very much lower level of support than more intensively farmed land.

Given the different situations summarised above, the policy changes that are needed to improve support to HNVF are also different. In Romania, the basic change discussed in the example is to extend the existing support package (SAPS, LFA and agri-environment) to all HNVF, implying an increase in total expenditure on HNVF of between 1.68 and 2.23 times compared with current expenditure, depending on the estimate of HNVF extent. These estimates assume that all HNVF requires support of €320 per hectare, probably an over-estimate for larger-scale grazing systems. A much more accurate estimate could be made by dividing HNV farms into several categories according to broad farming system and farm size.

In Scotland and Spain, there is also a need to extend existing schemes to a wider HNVF area. In the case of Aragón, extending the current package of LFA, agri-environment and Article 68 to all HNVF within Natura 2000 would require approximately a 5.5 times increase in expenditure on these measures on this land, reaching an average estimated at €127 per hectare (in addition to SPS). However, in both Spain and Scotland, the examples suggest that

it is not just a question of extending the coverage of existing agri-environment schemes; some restructuring of the overall CAP support package is needed, and would be a more rational policy response. In particular, changes to the criteria applied to LFA payments and SPS could achieve a major shift in support in favour of HNVF. It is notable that the level of HNVF support proposed in Romania (€320 per hectare) could be achieved for all farmland in Aragón by converting the regional SPS budget from a historic to a flat-rate payment (€319 per hectare).

In other words, HNVF in Scotland and Spain receives a very low level of support from the CAP overall, because the policy package is skewed heavily in favour of more intensively-farmed land, unlike in Romania. The examples raise the question of what could be done with LFA and Pillar 1 payments to provide a more balanced support that would favour HNVF. However, to be effective in supporting HNV farming, payments must be linked to at least a basic level of livestock farming activity. The Scotland example illustrates clearly how under current SPS and LFA requirements, the rational response of farmers would be to reduce activity to an absolute minimum, not maintaining the HNVF system. In Spain, activity can be reduced to simple mechanical clearance of vegetation. For Pillar 1 and LFA payments to support HNVF, there must be requirements at least for appropriate minimum livestock densities.

Possible policy options discussed in the examples include merging LFA and agri-environment to create a widely-available HNVF support measure with simple conditions such as livestock densities; and using an Article 68 type mechanism to establish HNVF support measures for specific farming sectors with Pillar 1 funding, thus addressing the very significant issue of national co-finance that limits the use of Pillar 2 measures in some countries.

9 Estimating EU funding needs for HNV farming - an ecosystem approach

Key findings

- **This approach estimates the scale of the additional funding required at EU-27 level to maintain and restore HNVF semi-natural habitats by 2020, in the face of expected pressures. The methodology used the estimated extent of HNVF land, the reported conservation status of HNV farmland habitats and the payment rates used for agri-environment and similar measures.**

- **The estimates cover HNVF natural and semi-natural grasslands and their associated landscape features, grazed heaths, moorland and tundra, grazed *maquis, phrygana* and other Mediterranean scrub (but omit the large areas of wooded pastures in the Iberian peninsula, because conservation data were not available).**

- **The additional cost is estimated to be between €130 and €1,100 million per annum to maintain existing HNVF habitats and restore 15 per cent of degraded areas rising to between €730 million and €3,300 million if 100 per cent of the degraded habitats are restored by 2020. The large range is explained by the lack of precise data on the extent and level of degradation of HNVF habitats. Some areas would much more costly to restore, to meet the 100 per cent target.**

9.1 Introduction to the ecosystem approach

This approach provides an estimate of the expected total additional costs of maintaining and restoring HNV Type 1 areas across the EU-27 in 2020 taking into account expected EU spending on HNVF and HNVF degradation levels. The methodology is adapted from that developed for the study estimating the financing needed to implement Target 2 of the EU Biodiversity Strategy (Tucker *et al,* 2013), hereafter referred to as the Target 2 Costs Study. The Target 2 Costs Study approach is used here because that study, and the preceding related rural land use costs study (Hart *et al*, 2011), quantified EU level ecosystem pressures and degradation levels and estimated the unit costs of maintaining and restoring farmland ecosystems. The key components of these overall cost estimates can be used, together with the estimates of HNVF extent within each Member State, broken down into farming systems using particular ecosystems, to calculate EU-wide HNVF maintenance and restoration costs. This avoids the need for a lengthy compilation of degradation and agri-environment costs data that would have been beyond the scope of this study.

However, it is important to note that the Target 2 Study approach was developed to address a much wider task that was not focussed on HNVF. Most notably the study estimated the additional annual costs of maintaining key farming practices across all farmland ecosystems (including intensively managed arable and grassland) not just HNVF land; the extent of these farmland ecosystems was estimated using CORINE land cover data (which does not distinguish HNVF), rather than the HNV area estimates presented in Chapter 3; and the costs of the additional land management support (principally through the EAFRD measures for agri-environment and non-productive investments) were based on an analysis of RDP payments across the EU for all types and intensities of farming systems, not just HNV systems. Although the approach has been adapted for this HNVF study, there remain some constraints on its application.

The most notable change is that this method now uses the estimates of HNVF areas from this study as the basis for scaling up the Target 2 study estimates of per hectare maintenance and restoration costs. This method also calculates the costs of restoring 100 per cent of degraded HNVF as well as 15 per cent, the latter being the only target examined in the Target 2 Study. The key limitation with the Target 2 Study approach relates to its application to HNVF Types 2 and 3, because these primarily form a subset of the arable and improved grassland ecosystem types considered in the study. As a result, estimated pressure and degradation levels were not based on the situation specifically relating to HNVF. Furthermore, the costed agri-environment measures are more representative of requirements for farmland that is more intensively managed than most areas of Type 2 and 3 HNVF. Therefore the estimates of degradation levels and the costs of measures used in the Target 2 Study cannot be reliably used to calculate costs for these HNVF types. Moreover, even if the Target 2 Study data could be adjusted to take account of this, the estimates of the area of HNVF Types 2 and 3 are considered to be unreliable, largely due to the different interpretations that Member States and experts have over their definitions, and lack of relevant data (see Chapter 3). Consequently, the cost calculations outlined in this chapter using the Target 2 approach only provide EU-27 estimates of the *additional* costs of maintenance and restoration of HNV Type 1 farmland (ie semi-natural ecosystems).

The cost calculation methodology centres around the key steps shown in

Figure 9.1 and Box 9.1. The geographical scope of the empirical application of this methodology is the EU-27. These steps were carried out for each of four semi-natural ecosystem types which can be considered to equate broadly to sub-divisions of Type 1 HNVF: natural and semi-natural grasslands, heathland and tundra, sclerophyllous vegetation and mires (bogs and fens). Although this approach requires a large number of quantified assumptions to be made, it is both systematic and transparent to allow all calculations to be subject to scrutiny.

Box 9.1: Steps involved in calculating the costs of maintaining and restoring ecosystems comprising Type 1 HNVF

1. Estimation of the likely lowest and highest area of Type 1 HNVF within each ecosystem type area in the EU, drawn from the findings of this study and based on:
   - data on total estimated extent of HNVF at Member State level;
   - estimates, drawn mainly from the case studies, of the proportion of HNVF that is Type 1 (semi-natural habitats) and the proportion used by different farming systems;
   - a breakdown of these areas into ecosystem types.

2. The identification of key pressures (ie the most important pressures that need to be addressed in order to maintain and restore the ecosystem) affecting Type 1 HNVF within each ecosystem type and the percentage of the ecosystem significantly impacted by each key pressure in:
   - 2010, ie the baseline year (or as close to 2010 as data allow);
   - 2020 according to a reference scenario, which takes into account existing policies and measures (eg the CAP, WFD, and National Emissions Ceilings Directive) as well as anticipated changes in drivers of land use change.

3. Identification of key measures that are typically used to address one or more of the key pressures affecting Type 1 HNVF and their ecosystem-specific unit costs (from the Task 2 Costs Study).

4. Calculation of the total additional costs of maintaining the ecosystem plus the additional costs of restoration (based on estimates of the expected percentage of each ecosystem degraded by each key specific pressure in 2020 and the costs of specific key measures to address these pressures). The restoration costs were calculated for two restoration targets:
   A. restoring 15 per cent of all degraded Type 1 HNVF areas (ie the overall 15 per cent EU-wide Biodiversity Strategy ecosystem restoration target); OR
   B. restoring 100 per cent of all degraded Type 1 HNVF areas.

Because of uncertainty about the levels of degradation and the extent of Type 1 HNVF in most Member States, two variables were used for each of these elements, generating four different estimated additional costs for each of the four ecosystems, based on:

- low estimate of Type 1 HNVF extent and low estimate of proportion of the habitat that is degraded;
- low estimate of Type 1 HNVF extent and high estimate of proportion of the habitat that is degraded;
- high estimate of Type 1 HNVF extent and low estimate of proportion of the habitat that is degraded;
- high estimate of Type 1 HNVF extent and high estimate of proportion of the habitat that is degraded.

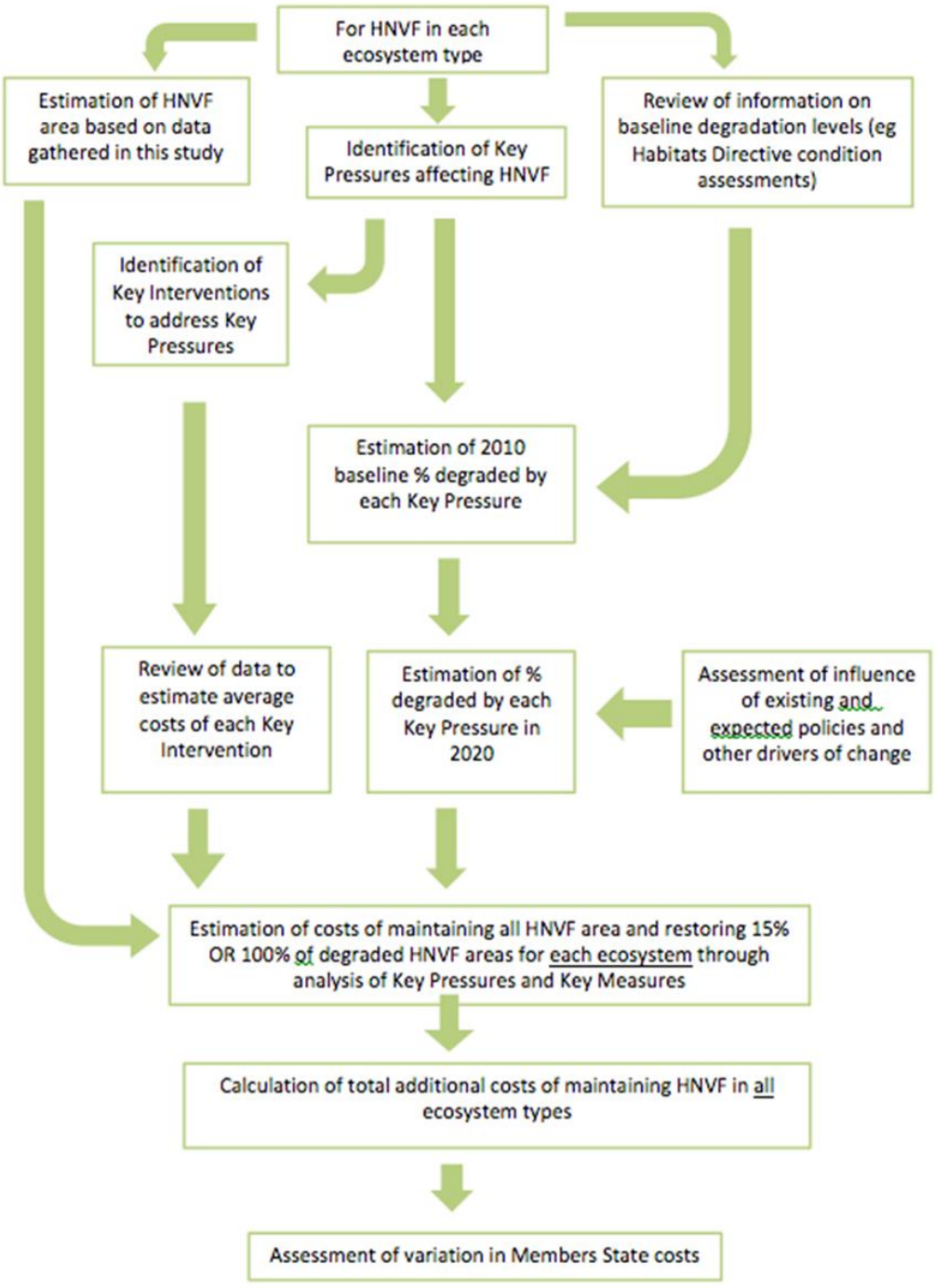
9.1.1 *Defining degradation and restoration*

To enable the calculation of HNVF maintenance and restoration costs, it is firstly necessary to define what is meant by restoration, and in turn what is degraded and therefore requires restoration. These issues are complex and are discussed in detail in the Target 2 Costs study. In summary, restoration is defined as 'the process of actively managing the recovery of an ecosystem that has been degraded, damaged or destroyed as a means of sustaining ecosystem resilience and conserving biodiversity.' This is in accordance with guidance on the CBD's Aichi restoration target (Target 15) which appears to be taken from the Society for Ecological Restoration (SER), a renowned international authority on restoration, which simply defines restoration as 'the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed' (SERI, 2004).

Unfortunately neither the EU Biodiversity Strategy nor the CBD provide a definition of degradation with respect to their targets. This makes it difficult to quantify the area over which restoration will need to be carried out for Type 1 HNVF areas in each ecosystem. However, it seems reasonable to take the definition of Favourable Conservation Status for habitats used in the Habitats Directive as a description of non-degraded Type 1 HNVF. This is appropriate because Type 1 HNVF is mostly made up of habitats that are of Community importance, ie listed in the Habitats Directive. Favourable Conservation Status can be described, in simple terms, as a situation where a habitat type or species is prospering (in both quality and extent/population) and with good prospects to do so in future. Its more formal definition, under Article 1 of the Directive, takes into account parameters including the 'extent of the area in which the habitat or species is found, the surface of the habitat area, its structure and functions (in case of habitat), the size of the population, its age structure, mortality and reproduction (of species)' (ETC/BD, 2006).

The adoption of Favourable Conservation Status as a definition of a non-degraded habitat also has practical benefits because the Habitats Directive related monitoring data on habitat conservation status are the most comprehensive and standardised data that can be used to assess degradation levels (see Box 9.2). This study therefore assumed that areas of Type 1 HNVF are degraded if their habitats have an unfavourable conservation status as defined in the EU Habitats Directive and related guidance.

Figure 9.1: Overview of the calculation of additional costs of maintaining Type 1 HNVF ecosystems and restoring 15% or 100% of degraded Type 1 HNVF ecosystems



For the purposes of both the Target 2 Cost Study and this study the restoration objective is like-for-like, ie there is no change in ecosystem type. It should be noted also that this study does not include any re-creation objectives (ie the re-creation of an ecosystem in the location of another existing type of ecosystem) or associated costs. For example, it does not consider the potential costs of re-creating former semi-natural grassland on an area that has been converted to intensive grassland.

Box 9.2: Article 17 reporting of the conservation status of habitats and species under the Habitats Directive

Under Article 17 of the Habitats Directive, Member States must report every six years on their progress in implementing the Directive, including on the conservation status of habitats and species of Community interest within their territories. To facilitate this a common assessment methodology was established in 2005, followed by supplementary guidance in 2006 (ETC/BD, 2006) to ensure a standardised reporting methodology. Nonetheless, differences in the way the data were collected and presented caused difficulties in presenting an overview at the EU level (ETC/BD, 2006).

Based on the reporting information, the Commission is required to produce a composite report including an overview of the conservation status of habitats and species of Community interest. The first ever reports were submitted in 2007 and 2008, covering the reporting period from 2001 to 2006, and included the conservation status of every habitat type (216 in total) and species (1182 in total) covered by the Directive for the EU-25 (Romania and Bulgaria were not required to report). The Commission published its first composite report in 2009 (ETC/BD, 2006).

For the purposes of reporting, Europe was divided into seven land and four marine 'bio-geographic regions', based upon similarities in climate, altitude and geology. The Member States' reports were used to assess conservation status across these regions by weighting each Member States' assessments according to the proportion of that species or habitat found within the national territories. These results were then aggregated to give a single, integrated assessment for each bio-geographical region. In total, 701 habitat assessments and 2,240 species assessments were made at bio-geographic level. More information is available on the website (http://biodiversity.eionet.europa.eu/article17) of the Member State assessments of conservation status (including maps and data sheets) and a detailed technical report.

Although the Article 17 assessments provide the best available EU standardised data on habitat condition, it should be borne in mind that they are incomplete, and there are some important data gaps including for countries with high amounts of Type 1 HNVF such as Greece and Spain.

The final component of the restoration objective that needs to be defined is the appropriate baseline date against which any restoration target needs to be set. This could be simply be current levels of degradation, but in practice these are not known as it takes several years of monitoring and analysis to carry out and report on the status of ecosystems. Therefore, the Target 2 Cost study, and this study, used the assessments in the 2010 Biodiversity Baseline report (EEA, 2010) to define degradation levels and hence restoration requirements. However, it should be noted that the data that the report was based on were mostly collected between 2001 and 2006.

9.1.2 The ecosystem typology used for the calculation

This study uses the ecosystem typology used in the Target 2 Costs Study report, but importantly, applies this to the data on Type 1 HNVF derived from work carried out within this study for each Member State as a basis for estimating the area of HNVF. On this basis

the ecosystem types that comprise Type 1 HNVF included in this study are described in Table 9.1 below.

Table 9.1: Semi-natural ecosystem types comprising Type 1 HNVF included in the cost estimation

Ecosystem type	Description
Natural and semi-natural grasslands	All grassland areas that are dominated by native grassland vegetation, including pastures and meadows, and their boundary features
Heathland and tundra	Grazed heath, moorland and tundra, but excludes tundra grazed by semi-domesticated reindeer and therefore in practice all tundra areas in Fennoscandia.
Sclerophyllous vegetation	Grazed *maquis, phrygana* and other Mediterranean scrub types.
Mires	Including grazed blanket bog

Wooded pastures, such as *dehesa* were not included as a separate ecosystem type in the Target 2 study because their area could not be differentiated from other semi-natural grassland areas with trees using CORINE data. Although this HNVF study does provide estimates of the areas of wooded pastures we have not been able to provide a reliable estimate of the costs of maintaining and restoring these habitat types. This is because, although we know that the main pressures on wooded pastures are abandonment, oak disease, overgrazing, intensification and clearance (Bergmeier *et al,* 2012), there is insufficient quantitative information available on the condition of these habitats (eg because Article 17 assessments for the habitats are lacking from Spain[80]). Further research would also be required to ascertain the management measures needed to restore them to favourable status and the costs of these measures. Therefore the Target 2 Study methodology is not used to estimate the costs of maintaining and restoring wooded pastures.

9.1.3 Estimation of Type 1 HNVF areas within each ecosystem type

For each Member State, minimum and maximum figures of overall extent of Type 1 HNVF were estimated based on the information provided by experts for this study where available at the time or JRC/EEA (2012) estimates of likely Type 1 HNVF extent for other Member States.

The minimum and maximum estimates of total HNVF area were then disaggregated into the four ecosystem types listed in Table 9.1 using the information supplied by the Member States case studies, except where this information was lacking (see below). The area reported as livestock grazing was based on information about HNV farming systems provided in the case studies, where necessary supported by an analysis of the relative proportions of the corresponding Annex I habitats as reported by Member States under the Habitats Directive (ETC/BD 2008). The area reported by case studies as mixed farming or mosaic farming was disaggregated into semi-natural ecosystem types according to the information provided and based on assumptions made about the composition of mixed farmland in that country. These assumptions were based on information reported in

[80] http://bd.eionet.europa.eu/article17/habitatsummary/?group=Z3Jhc3NsYW5kcw%3D%3D&habitat=6310&region=

Oppermann *et al* (2012), and on information from the case studies on the relative intensity of the farmland (it was assumed that low intensity mixed farmland had a higher proportion of grazing and farmland features and a lower proportion of arable). For Member States where the case study reports were incomplete or lacking (Belgium (Wallonia), Denmark, France, Lithuania, Poland, Slovenia) the disaggregation used assumptions based on the information available in Oppermann *et al* (2012), the relative proportions of Annex I habitat dependent on farming reported by the Member State (ETC/BD 2008) and on the study team's knowledge of the degree of agricultural intensification in that Member State.

Luxembourg and Malta were excluded from the calculation, because HNVF information could not be obtained, but because these two Member States are estimated by EEA/JRC to have less than 0. 2% of the HNV farmland in EU-27 this does not affect the overall cost estimates.

9.1.4 Estimation of baseline and 2020 reference scenario degradation levels and key pressures

The next step in the calculation of Type 1 HNVF maintenance and restoration costs was the estimation of baseline (ie 2010) pressure-specific degradation levels for each ecosystem type. These estimates were taken from the Target 2 Costs Study, which drew on available literature and quantitative monitoring data where available. Data sources that are as close to 2010 as possible were used to ascertain these levels, but it should be noted that the most relevant data were those from the monitoring of habitats of Community interest under the Habitats Directive, which were collected between 2000 and 2006 and reported on by the Commission in 2007 and used in the EEA Biodiversity Baseline Report in 2010 (EEA, 2010). There is therefore in most situations a time discrepancy between the collected data and the reported condition of the ecosystem.

The Target 2 Costs Study then used the baseline estimates of overall and pressure-specific degradation levels as a basis for the development of the 2020 reference scenarios. These were primarily judgements by the study team, which attempted to take into account the expected effects of land use drivers, policies, legislation (eg under the Birds and Habitats Directives and the WFD) and funding (such as CAP payments) on the pressures and overall degradation values within each ecosystem type. The 2020 reference scenario estimates of overall degradation levels and pressure-specific degradation levels were then used in the calculations of ecosystem-specific maintenance and restoration costs.

As a result of the subjective nature of these assessments and uncertainties over trends in drivers and the future implementation and effectiveness of policies it should be noted that the reference scenarios are highly uncertain, and should be only be regarded as indicative for the purposes of this study. To help address this uncertainty, expected minimum and maximum levels of pressure-specific degradation were estimated in the Target 2 Costs Study and these are used here.

9.1.5 Estimation of the additional costs

It is important to note that the Target 2 Study and this EU wide ecosystem-based estimate of the costs of maintaining and restoring Type 1 HNVF are *additional* to those anticipated in 2020 under the reference scenario (eg continuation of funding for HNVF systems as under

the current CAP framework[81]). This means that payments that are already contributing to the maintenance and restoration of these ecosystems under the current CAP framework, (as discussed in Chapters 5 and 6) are excluded from these EU ecosystem based cost estimates. If rural development expenditure targeted at HNVF or direct payments for these farming systems were to change for the 2014-2020 period, this would have an effect on these cost estimates, depending on how significant the changes, the type of payment to which they related and whether they resulted in more or less funding available for HNVF systems.

The costs of individual key ecosystem maintenance and restoration measures were estimated in the Target 2 Costs Study through a detailed and extensive search of published scientific literature; assessment of agri-environment payment rate data (drawing on data collated for the rural land uses costs study (Hart *et al*, 2011) and unpublished IEEP databases); assessment of selected LIFE Nature projects; and consultations with habitat restoration experts.

Although considerable efforts have been made to obtain habitat restoration cost information, the literature review revealed a number of significant data constraints on the analysis (Box 9.3). Most importantly, records of habitat restoration costs were found to be rare in published peer-reviewed literature and approaches to costing are variable with some studies reporting only capital and labour costs whilst others report a single overall cost for the project (Bullock *et al,* 2011). Additionally, although there is a considerable body of knowledge on habitat restoration in Europe, much of the information remains in unpublished project reports and databases. For these reasons most of the estimates of maintenance and restoration costs used in this study come from agri-environment schemes, which have calculated the costs on the basis of income foregone, costs incurred and possibly transaction costs, according to CAP rules[82]. These therefore provide a fairly reliable estimate of the costs of the actions that are included in such schemes. However, the data also show that the costs vary considerably as a result of variations in the actions and their levels of ambition as well as differences in land management costs amongst Member States. It was difficult therefore to deduce from these datasets typical average costs of key measures.

Box 9.3: Data constraints on the analysis of habitat maintenance and restoration costs

Scientific literature rarely contain cost estimates

Relatively few detailed data on specific ecosystem restoration costs are available in the mainstream scientific literature and approaches to costing are variable. Most studies on restoration focus on the degree of biodiversity success for different measures, but actual costs of the measures deployed are scarcely reported. In a review of over 20,000 restoration cases studies for the TEEB report, for example, only 96 were found to provide meaningful cost data (TEEB, 2011).

Reports on costs of measures are not easily accessible

[81] It should be noted that the Target 2 Costs study did not take account of the fundamental changes to Pillar 1 support or the reduced overall CAP budget (agreed in 2013) when establishing the reference scenario as these decisions had not been made at that time.

[82] Article 39(4) of EC Regulation 1698/2005.

It is believed that a considerable body of knowledge on costs of different restoration measures exists, for example with land managers organisations. However, these data are not readily accessible (often due to publication in a local language) or remain unpublished. Some Member States have established national averages of management costs for different habitats, for example within a frame of subsidy schemes for site management. In the Netherlands, for instance, costs of habitat management have been extensively debated between government and land management organisations, resulting in a report that provides widely agreed average costs for habitat management (Verheijen *et al,* 2009). These data are split into costs for different actions per habitat type and therefore provided a valuable resource for the Target 2 Study. However, comparable figures for other Member States were not found.

Costs vary between Member States

As habitat management often requires manual labour and machine handling, among the main components of cost for restoration actions are the deployment of staff/labour hours and the costs of machinery (fuel, capital costs, etc). As costs of labour and fuel vary widely within the EU (Eurostat reports difference in average labour costs between European (NUTS 1) regions of up to a factor of 25), the cost of restoration measures for habitats are expected to show a significant regional variation as well. Therefore care must be taken when cost data for restoration are only available in one or a few Member States.

Costs vary depending on the size of the area being maintained or restored

It is increasingly shown that economy of scale applies to site management and restoration costs. Armsworth (2011) shows that the size of a nature site area is the most important determinant of management costs for 78 small protected areas in the UK and that larger reserves offer costs savings over a set of small reserves of equal area. The costs per ha therefore have non-linear relationships with site area, such that protecting a 40 ha site would be expected to incur only double the costs involved in managing a 10 ha site. As the level of habitat fragmentation differs between European regions, economies of scale might be an important consideration when scaling up case study data to a higher (European) figure on restoration costs.

Source: Adapted from the Target 2 Costs Study (Tucker et al, 2013)

Relevant minimum, maximum and average ecosystem-specific cost data for each key intervention were compiled and entered onto the costs database (ie an Excel spreadsheet) that had been used for the Target 2 Costs Study. The collated data then provided the basis for the calculation of the ecosystem-specific maintenance and restoration costs. However, it should be noted that, because the cost data are not complete or necessarily fully representative samples, then some discretion was used in the calculation of unit cost of each measure, with atypical costs excluded from the calculations, for example. The resulting estimates of the costs of combined measures and key measures are not therefore simple arithmetic means, but attempt to reflect typical costs.

9.1.6 Some limitations of these cost estimates

The use of EU wide agri-environment costs data

Agri-environments payments rates must be based on the calculation of 'income foregone plus additional costs'[83]. In practice, however, payments calculated in this way may not always be sufficient to achieve the required management, as has been shown by the low uptake of certain management options under agri-environment schemes in some Member States (Poláková *et al,* 2011). Low payment levels are most likely to constrain the uptake of measures on agricultural land with very high opportunity costs (the better quality land)

[83] Article 39, paragraph 4, of the Rural Development Regulation (Council Regulation (EC) No 1698/2005) establishes that the payment shall cover additional costs and income forgone resulting from the commitment made; where necessary, they may also cover the transaction costs.

especially if they involve substantial changes in farming practices (which farmers are obliged to follow over the course of an agri-environment contract). Therefore, the risk of low uptake may be relatively low for semi-natural HNVF, if maintenance and restoration work can be done within an existing economically viable farming system and opportunity costs of the land are low. However there may be a much higher risk of poor uptake if opportunity costs of land or labour are high (for example if farming could be intensified or there are well paid jobs available locally) and the current farming system is uneconomic.

However, agri-environment payment rates may be a significant constraint on the full maintenance and restoration of Type 1 HNVF land if per unit costs rise significantly as the amount of required maintenance and restoration increases. In reality the marginal cost of restoring each ecosystem is likely to vary with the areas involved according to curves such as those shown in Figure 9.2. Costs are expected to be high with low levels of activity (eg because knowledge is lacking and it is not cost-effective to build or use specialist equipment). But then marginal costs would be expected to decline as maintenance and restoration activity increases due to economies-of-scale (see last paragraph of Box 9.3 above). But with further increasing quantity then it will become increasingly difficult to find suitable low-cost restoration areas and areas that require costly restoration measures will be increasingly come into play. It is therefore important to note that a significant constraint on the analysis undertaken in the Target 2 Costs Study, and therefore this study as well, is that it is not able to take into account the effects of potential variations in how much maintenance and restoration is required (which depends on degradation levels and restoration targets and on the availability of land that is suitable for restoration).

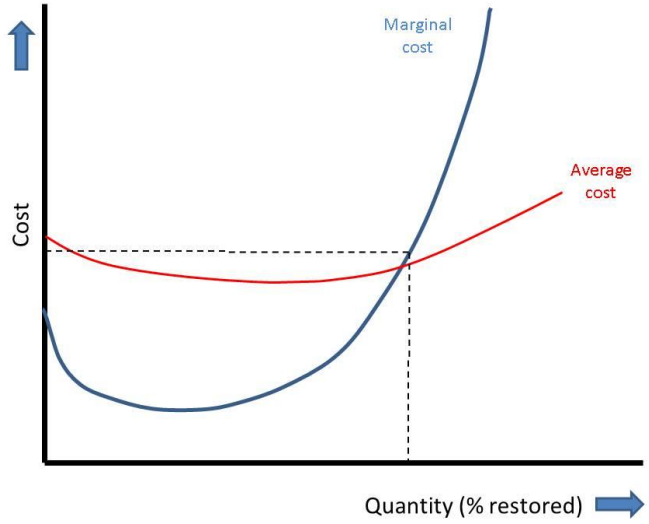
It should also be borne in mind that the shape of cost curves will vary according to ecosystem types and levels of degradation, such that some areas of ecosystems maybe relatively easily restored, such as through natural processes once pressures have been alleviated. But then costs may then rise steeply if more highly degraded areas that require more costly interventions (eg scrub removal or turf stripping) need to be restored. A steep cost curve such as this might be expected for many highly degraded Type 1 HNVF areas.

Although the likely shape of the cost curve can be deduced, there is insufficient information available on the relationship between actual costs and quantities of restoration to empirically estimate such relationships for any ecosystems. Consequently, it is important to note that this study uses agri-environment payment rates and other documented standard costs that are based on average costs observed in relation to the amount of maintenance and restoration being undertaken at the time. This is depicted by the red average cost curve in Figure 9.2, which indicates a hypothetical observed range of costs for the amount of restoration being undertaken at the time, as indicated by the dotted line. Thus the cost calculations do not vary in response to changes in the amount of required maintenance and restoration according to the marginal cost curve. In other words the per unit costs of maintenance and restoration measures that are based on current levels of maintenance remain the same even when they are to be applied to the larger areas of HNVF.

In practice agri-environment payment rates could increase over time in relation to requirements for greater take up of maintenance and restoration activities, thus increasing the costs beyond those estimated here. However, it is probably unrealistic to assume that it

would be acceptable to increase payments rates to the levels required to approach full maintenance and restoration of any ecosystem type.

Figure 9.2: Hypothetical marginal cost and average cost curves for ecosystem restoration



Own compilation

The true cost of untargeted support measures

A further very important limitation of this study is that the cost estimates are based on theoretical calculations that assume that the allocation of funds is in accordance with the theoretical need. The calculation of the actual payments that would probably be needed to achieve the desired results is a complex process as it will, for example, vary according to scheme design and the areas to be paid for. Therefore the estimates of costs should be treated as a first approximation that are likely to be higher in practice.

The need for proactive measures to achieve restoration by 2020

A further consideration that should be taken into account in this study is that some restoration can be 'passive', when an ecosystem is able to regenerate through natural process alone (eg re-colonisation) following the alleviation of pressures (eg under-grazing); or 'proactive', which involves measures such as the removal of scrub and trees and the replanting of vegetation. In many cases passive restoration is appropriate, but this may take decades and often proactive restoration may be required particularly for long abandoned areas of HNVF, with resulting higher cost implications. Therefore it should be borne in mind that restoration costs will vary according to the degree and period of degradation and the desired timescale for restoration.

9.2 Estimated total EU-27 additional annual maintenance and restoration cost for Type 1 HNVF land

The estimated total additional annual costs of maintaining and restoring Type 1 HNVF in the EU[84] (excluding wooded pastures) in each ecosystem are presented in Table 9.2.

[84] Although this estimate is based on data that do not include HNVF areas in Malta and Luxembourg, this does not have a significant impact on the broad cost estimates presented here.

Table 9.3 summarises these total costs for the 15 per cent and 100 per cent restoration scenarios.

Table 9.2: Total EU-27 estimated additional annual costs (million €) of maintaining and restoring Type 1 HNVF for each ecosystem type

Costs are rounded to 1 decimal point and 2 significant figures

a: Estimated additional annual costs of maintaining Type 1 HNVF areas

Degradation levels	Min	Max	Min	Max
HNV estimated extent	**Low**		**High**	
Natural and semi-natural grasslands	36.0	150.0	47.0	190.0
Heathland and tundra	2.2	17.0	2.7	21.0
Sclerophyllous vegetation	8.3	21.0	11.0	26.0
Mires (bogs and fens)	5.7	7.2	7.5	9.5
Total	**52.0**	**190.0**	**68.0**	**250.0**

b: Estimated additional annual costs of restoring 15% of degraded areas of Type 1 HNVF

Degradation levels	Min	Max	Min	Max
HNV estimated extent	**Low**		**High**	
Natural and semi-natural grasslands	45.0	422.0	59.0	550.0
Heathland and tundra	0.2	1.9	0.2	2.3
Sclerophyllous vegetation	28.0	183.0	36.0	234.0
Mires (bogs and fens)	6.5	19.0	8.6	26.0
Total	**80.0**	**630.0**	**100.0**	**810.0**

c: Estimated additional annual costs of restoring 100% of degraded areas of Type 1 HNVF

Degradation levels	Min	Max	Min	Max
HNV estimated extent	**Low**		**High**	
Natural and semi-natural grasslands	410.0	1,700.0	530.0	2,200.0
Heathland and tundra	1.1	9.9	1.3	12.0
Sclerophyllous vegetation	190.0	520.0	240.0	660.0
Mires (bogs and fens)	75.0	130.0	100.0	170.0
Total	**670.0**	**2,400.0**	**870.0**	**3,100.0**

Table 9.3: Total EU-27 estimated additional annual costs (million €) of maintaining and restoring Type 1 HNVF according to maintenance and restoration scenarios

Costs are rounded to 2 significant figures

Degradation levels	Min	Max	Min	Max
HNV estimated extent	**Low**		**High**	
Maintenance costs + 15% restoration	130	820	170	1,100
Maintenance costs + 100% restoration	730	2,600	940	3,300

10 HNVF characteristics and priorities in EU-27 Member States

This chapter summarises briefly the key features of HNVF in each of the EU-27 Member States as revealed by this study, drawing on the information sources used in previous chapters, primarily the case study reports prepared by the individual Member State experts and relevant sections in Oppermann et al (2012).

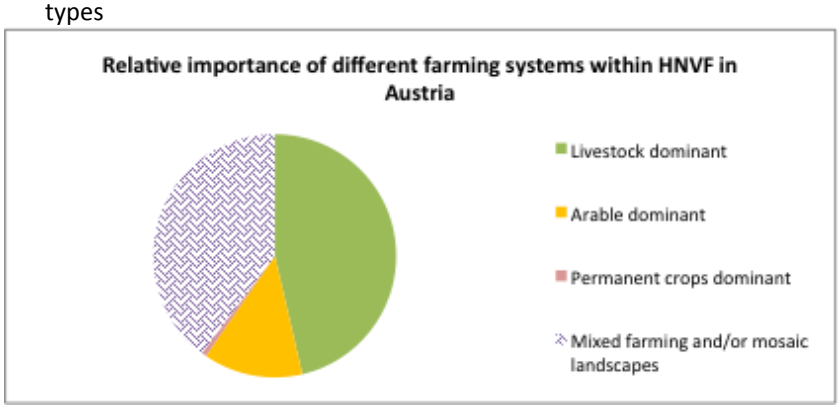
Each of the Member State sections below summarises:

- the main HNV farming systems (livestock dominant; arable dominant; permanent crops dominant; and mixed farming and/or mosaic landscapes) as identified in the case studies and, where possible, gives an indication of the relative importance of these farming systems within the HNVF of the Member State (in most cases, because of lack of data, this has to be based on expert judgement of estimated areas);
- the best available estimated extent of HNV farmland;
- progress made on defining the CMEF indicator;
- the CAP and related support measures (2007-13) that benefit HNVF;
- policy-relevant characteristics of HNVF;
- future priorities for CAP support for HNVF, where these have been identified by this study, for:
    - HNV farming systems;
    - support measures;
    - rules on eligibility for CAP support; and
    - data requirements to enable targeting and monitoring/evaluation.

AUSTRIA

HNV farming systems

- **Livestock dominant, Type 1:** Extensively managed grassland in lowland areas; alpine meadows and pastures; semi-intensive meadows and pastures; traditional orchards.
- **Arable dominant, Type 1:** Arable cropland with specific nature conservation measures or organically farmed.
- **Permanent crops dominant, Type 1:** Vineyards in terraces.
- **Mixed farming and mosaic landscapes, Type 2:** defined by structural elements, covers several farming types



Best available estimated extent of HNV farmland: The highest estimate is 1,138,000 ha and the lowest is 288,000ha. Both were calculated for work commissioned by the Ministry with the minimum estimate using very strict criteria.**CMEF indicators:** Indicator established using pre-existing data sets. This includes habitats and species data, and IACS/LPIS data on farming intensity for grasslands. This can be updated annually.

Identified **CAP support measures** of benefit to HNVF in Austria: 214

HNVF in Austria

Farmland in Austria is a heterogeneous mix of grassland, arable and permanent crops, and the land use types described above can only roughly be allocated to specific farming types. Type 1 HNV farmland is identified from land use intensity at the level of single field parcels, with a wide range of grassland types managed at different intensities, from seasonally grazed permanent alpine pastures (including wooded pastures) to semi-intensive, species-rich fertile meadows. Extensively cultivated arable land of low fertility can be found on marginal soils. Almost all farmland in Austria is registered on IACS and eligible for CAP support, and a high proportion of HNV farmland benefits from the great variety and financially well-supported measures of the agri-environment programme ÖPUL, which reaches around 75 per cent of Austrian farmers. Holdings farming less than 2 ha are not eligible (but many federal states use national funds to support nature conservation on micro-holdings). Proposed reductions in area-based CAP support on about 40,000 ha of extensively managed grasslands for 2014-20, have raised concerns that this would remove the incentive for farmers to continue farming this HNV land. Despite the popularity of ÖPUL there is a need to raise awareness of HNV management.

Future priorities identified by this study

HNV farming systems

- Extensively managed grasslands, especially those that will receive reduced direct payments in 2014-20
- HNV land where the 'loss of income' element is a relatively small part of agri-environment payments

Support measures

- Improved harmonization of procedures and guidelines across ministries, paying agencies and regional authorities
- Raising awareness of HNV management among the many farmers who think that extensively farmed plots indicate lazy or negligent farming

Rules on eligibility of HNVF for CAP support

- Improve clarity and predictability for farmers on eligibility of HNV land for CAP support

BELGIUM

HNV farming systems

- **Livestock dominant, Type 1:** Extensively cultivated grassland in low areas.
- **Arable dominant, Type 1:** Arable cropland with specific nature conservation measures.
- **Permanent crops dominant, Type 1:** Vineyards in terraces.
- **Mixed farming and mosaic landscapes, Type 2:** Mosaic of low intensity agriculture and natural and structural elements.

Best available estimated extent of HNV farmland: The highest estimate for both Flanders and Wallonia is 435,153 ha (JRC/EEA). The lowest available estimate for Flanders is 151,000 ha which was calculated by the Ministry. In Wallonia the lowest available estimate is 69,000 ha which is based on the area of farmland which coincides with the Main Ecological Infrastructure.

CMEF indicators: In Flanders the indicator was established by mapping semi-natural farmland habitats, mosaics with landscape elements and some species data. In Wallonia the indicator is farmland coinciding farmland with the Main Ecological Infrastructure (existing and proposed Natura 2000 areas and other sites of high biological interest.

Identified **CAP support measures** of benefit to HNVF in Belgium: 212, 213 and 214

HNVF in Belgium

Intensive systems dominate Belgian agriculture. The remaining HNV land is predominantly patches of extensively managed semi-natural grassland, with some heathland, coastal dunes and also farmland mosaics with field boundaries, some permanent grassland and traditional orchards. In Wallonia most of the HNV land is managed by conventional or organic livestock farmers who maintain HNV patches of extensively used grassland and Natura 2000 sites (mainly by mowing), landscape elements and traditional orchards; a small proportion of HNV land is managed by extensive livestock farms (suckler cows and sheep) where the land is predominantly species-rich grassland, often in protected areas. These farms tend to be are involved in nature conservation management, organic production and tourism.

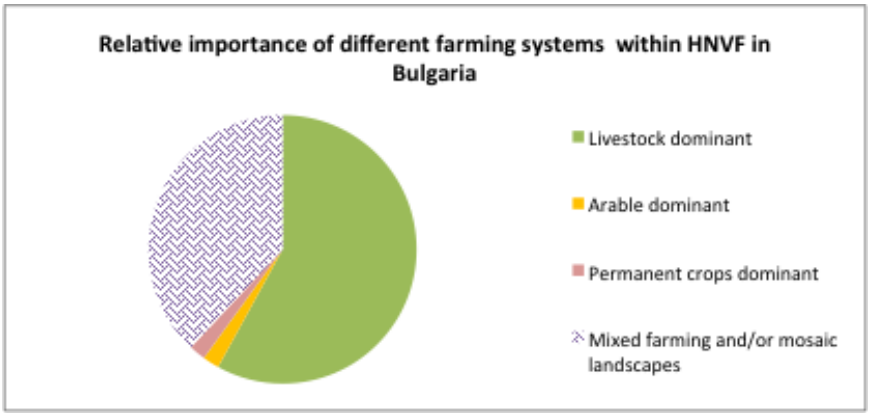
Future priorities identified by this study

No details available

BULGARIA

HNV farming systems

- **Livestock dominant, Type 1:** Subsistence, semi-subsistence or small family farms; predominantly grazing on semi-natural grasslands, transhumance in summer months; Farms produce their fodder and some low intensity crops; Use of common grasslands; no artificial fertilizers used on the grassland
- **Arable dominant, Type 3:** Intensive cereal and/or sunflower production
- **Permanent crops dominant, Type 2:** Traditional orchards and vineyards, for own consumption; grass under trees. Mainly abandoned or unmanaged
- **Mixed farming and mosaic landscapes, Type 2 and Type 1:** Mixed small-holdings with low intensity cropping. Small scale arable plots and orchards, near or in the villages, plus use of semi-natural vegetation in the plains and lowlands. Sometimes combined with honey production



Best available estimated extent of HNV farmland: 1,630,035 ha (as calculated by work for the Ministry)

CMEF indicators: HNVF area is defined by a combination of CORINE, Natura 2000, IBAs, grassland habitats, and selected species data. An initial exercise was done by WWF for the Ministry, then reviewed by other consultants.

Identified **CAP support measures** of benefit to HNVF in Bulgaria: 211; 212; 213; 214; and State Aid.

HNVF in Bulgaria

The pressures on HNV farmers in Bulgaria are such that unless remedial measures are taken quickly, the time for addressing them will be gone. Associated with an ageing and declining population living on a very low income, it is quite clear that the prospects for HNV farming systems are extremely bleak at present. Poor economic returns from grazing animals on low-productivity semi-natural grasslands and from hay-making is resulting in these practices declining and disappearing, leading to the abandonment of grasslands, especially in the mountains, or, in some lowland areas, their conversion to arable land. Bulgarian legislation and CAP support measures do not favour low intensity HNV farming systems, with the practical effect of excluding many of these farmers from support that is available to more intensive systems. Only 62 per cent of the area identified as HNV farmland is eligible for SAPS, and of the four land uses most likely to have large areas of HNV farmland, significant proportions are not eligible for CAP support (42% of mixed land uses, 47% of permanent crops 56% of pastures, common grazings and meadows, and more than 90% of the small holdings know 'family gardens' are ineligible). Reasons include: the area managed by individual farmers is under the minimum threshold for support (1 ha); many farmers use common grazings, but do not receive payments; cross-compliance rules and implementation exclude HNV farmland from support.

Future priorities for CAP support

HNV farming systems

- Mixed small holdings with low intensity cropping; livestock dominant family farms; traditional orchards.

Support measures

- Area-based payments from P1 and P2 (agri-environment, LFA and N 2000 payments); investment support for production, marketing-related and local development projects integrating HNV farming within overall local development vision and strategy;
- Coupled payments for extensive grazing systems plus support for acquiring grazing livestock (up to defined ceiling),
- Advisory services and capacity building.

Rules on eligibility of HNVF for CAP support

- All HNV farmlands should be made eligible for P1 payments, by replacing tree cover rule with a definition reflecting the national/regional conditions, and allowing support to farmers with less than 1ha
- Adapting GAEC requirements to HNVF practices and Natura 2000 legislation

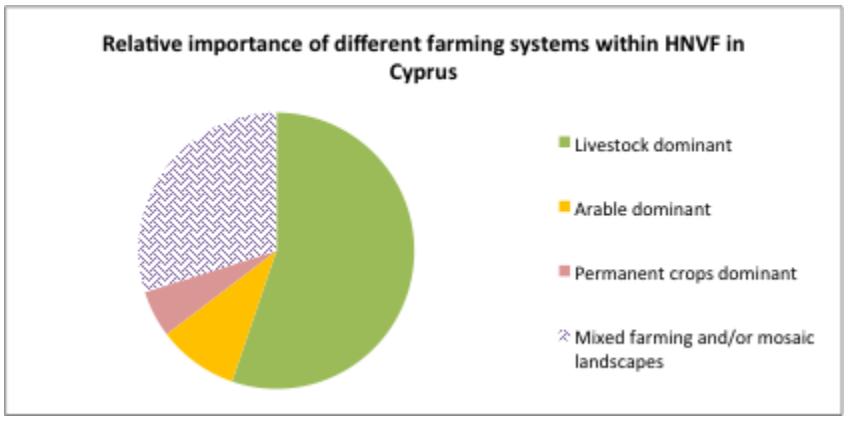
Data requirements to enable targeting and monitoring/evaluation

- Ground-testing land use databases that are based on remote sensing; linking these to particular farming types and systems;
- Integrate data on common land (800 000 ha) used for grazing in farm structure survey.

CYPRUS

HNV farming systems

- **Livestock dominant, Type 1:** Grazed scrublands/*phrygana*; grazed carob and olive groves
- **Arable dominant, Type 2 and Type 3:** Low-intensity cereals; cereals with olives/carobs
- **Permanent crops dominant, Type 2:** Olive groves, almond groves, and upland vineyards
- **Mixed farming and mosaic landscapes, Type 2:** Farmland mosaics (HNV landscape)



Best available estimated extent of HNV farmland: The highest estimate is 343,209 ha (JRC/EEA) and the lowest is 110,000 ha (RDP).

CMEF indicators: not yet defined, work has been contracted to university

Identified **CAP support measures** of benefit to HNVF in Cyprus: 211; 212; 214; and State Aid.

HNVF in Cyprus

The importance of HNV farming is acknowledged, but there is no official, state classification of HNV farmland types in Cyprus. Based on what work has been done, the eight main types of HNV farmland identified for this study include examples of all three HNV Types. Livestock systems are based on goat and sheep grazing of semi-natural scrublands, *phrygana,* carob and olive groves. Type 2 patchwork farmland mosaics of grazing land, low-intensity cereals, permanent crops, natural vegetation and scrub/trees provide a diverse range of habitats. Intensification and abandonment have been a feature of Cypriot agriculture for decades. The proportion of uncultivated or abandoned farmland more than doubled from 12.7 per cent of agricultural land in 1960 to 27.5 per cent in 1999 (especially affecting almonds, carobs and vineyards). Over the same period the proportion of annual fallow dropped from 33 per cent to 3.2 per cent. The absence of a clear identification or mapping of HNVF areas in Cyprus make it difficult to assess the extent to which the remaining HNV farming is being supported by relevant CAP payments.

Future priorities identified by this study

HNV farming systems

- Grazed scrublands/*phrygana*
- Upland vineyards
- Farmland mosaics

Support measures

- Pillar 1 SAPS/basic payment on a regional basis, with HNVF as one region with higher support levels
- HNVF sub-programme in the Cyprus RDP for 2014-20, to facilitate preferential HNV payment rates and easy streamlined access to support for HNV farmers
- Advisory services providing specific support and advice on HNV farming methods
- Coupled livestock payments for herds of sheep and or goats grazed in a traditional, free-ranging manner, with maximum herd size linked to the carrying capacity of the grazing area
- Existing '*agri-environment schemes for traditional orchards and bushes, with emphasis on LFA'* upgraded and targeted at maintenance of key HNVF land, features and practices, and sub-schemes targeting vineyards, groves and cereals.

Rules on eligibility of HNVF for CAP support

- Include HNVF criterion in LFA-type payments, to ensure HNV areas benefit

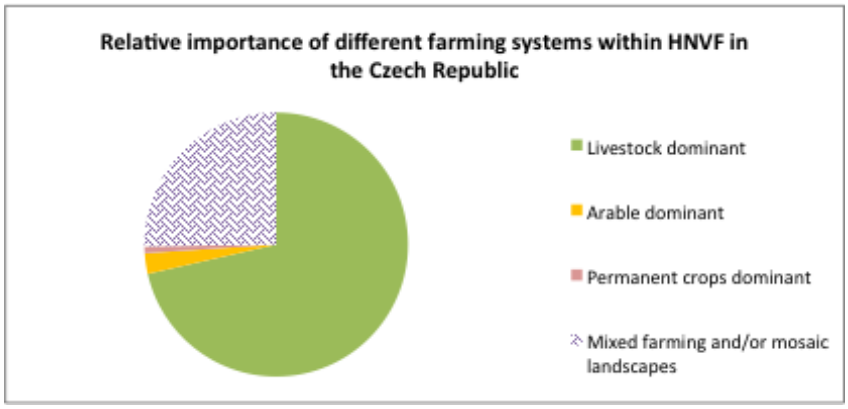
Data requirements to enable targeting and monitoring/evaluation:

- Definition and mapping of HNV characteristics in Cyprus

CZECH REPUBLIC

HNV farming systems

- **Livestock dominant, Type 1 and Type 3 (very limited area of Type 2):** Extensively managed mountain and highland grasslands;
- **Arable dominant, Type 1 and Type 3:** Lowland grasslands, and conventional arable crops (bird nesting sites);
- **Permanent crops dominant, Type 1:** Old orchards;
- **Mixed farming, Type 1 (rarely Type 2) and Type 3:** Higland grasslands, wet grasslands, extensively managed semi-natural grasslands on farms with intensive arable.



Best available estimated extent of HNV farmland: 550,000 ha (RDP).

CMEF indicators: Indicator currently defines HNVF area as farmland in protected areas, including Natura 2000, but on-going work will produce a more refined HNVF indicator.

Identified **CAP support measures** of benefit to HNVF in Czech Republic: 211; 213; 214; and State aid.

HNVF in Czech Republic

The current definition of HNVF is being revised to include HNV land outside protected areas and this is expected to lead to a substantial increase in the total extent of HNVF, mainly of semi-natural grasslands outside nature protection areas, and a continuation of the current trend towards more tailored agri-environment schemes and better geographical targeting. Type 1 HNV is almost entirely extensively managed semi-natural grasslands, mainly on large farms in open landscapes, grazed at low stocking densities (< 1 LU/ha) and used for hay or silage. Most HNV grasslands are managed extensively or with habitat-specific management. More than 82 per cent of all grasslands benefit from agri-environment payments, and for HNV land (only) agri-environment sub-schemes are specifically tailored to the management needs of particular grassland habitats or species (eg breeding corncrake). Half of the grassland in agri-environment schemes also benefits from organic support. The small area of Type 1 traditional orchards is declining because these old orchards are increasingly unmanaged and at risk. Type 2 HNV is scarce in the open Czech landscape. The mixed farming category has areas of Type 1 semi-natural grasslands among intensively managed arable crops. Type 3 is land on conventional farms important for breeding birds (especially corncrake) and butterflies.

Future priorities for CAP support

HNV farming systems:

- The area of HNV grasslands will double after the new designation criteria for HNVF, and options should be examined to make agri-environment funds available for habitat and species-specific management of the additional areas;
- Examine options for overcoming low administrative capacity and lack of shared institutional responsibility in HNV areas outside protected zones;
- Examine options for overcoming lack of agri-environment funds to support to traditional orchards.

Support measures:

- Significantly improve capacity of farm advisories relating to agri-environment management requirements in schemes for the most valuable HNVF land, to overcome farmer' lack of knowledge and trust
- Provide non-productive investment support to complement agri-environment schemes (eg fencing, farm plan design); obstacles to designing and implementing such a scheme are lack of funds, and lack of institutional experience and knowledge in the design/delivery of such measure.

Data requirements to enable targeting and monitoring/evaluation

- Examine options for overcoming issues in biodiversity monitoring when the area of HNV grasslands doubles after the new designation;
- Extend number of plot samples for monitoring and gather data on the change of quality of sites over time.
- Develop data series for evaluation of status of HNVF land over time.

DENMARK

HNV farming systems

- **Livestock dominant, Type 1:** Open semi-natural grasslands; and open heath and bog.
- **Arable dominant, Type 1 and 2:** Permanent grassland on arable farms; and semi-natural unfarmed features on arable farms.

Best available estimated extent of HNV farmland: The best available estimate is 191,262 ha (JRC/EEA).

CMEF indicators: At present limited to extensive farmland within Natura 2000, but work is underway to map all HMV farmland in Denmark.

Identified **CAP support measures** of benefit to HNVF in Denmark: 214.

HNVF in Denmark

Denmark is dominated by intensive farming, and the remaining HNV land is semi-natural open grasslands, heath and bog habitats scattered across many small areas, most of which have been cultivated, fertilized or drained to some extent. These HNV areas are managed by low intensity mowing and/or grazing with sheep and cattle, but the quality of the forage tends to be poor and the parcels are often inaccessible and fragmented. In some areas of Denmark restrictions on manure disposal and existing stocking rates also make re-introduction of grazing difficult. Permanent grassland on arable farms is grazed by dairy heifers or suckler cows.

Future priorities

No information available

ESTONIA

HNV farming systems

- **Livestock dominant, Type 1 and potentially Type 3):** Management of coastal meadows (1630); wooded meadows (6530); wooded pastures (9070) and other meadows; Nordic alvars (6280); management of semi-natural grasslands where habitats are mainly mown (and grass sold) not grazed - floodplain meadows (6450); and grassland dominated organic farming not covered by two previous types;
- **Arable dominant, Type 2:** Arable land dominated organic farming;
- **Permanent crops dominant:** not applicable
- **Mixed farming and mosaic landscapes, Type 2 and potentially Type 3):** other detached permanent and short-term grassland areas which are mown only; organic farming; low-intensity conventional mixed farming (animal density; share of permanent grasslands; location on Natura 2000 areas; occurrence of selected farmland bird species and protected species); animal husbandry/dairy farming, arable farming and mixed farming in mosaic landscapes

Best available estimated extent of HNV farmland: 531,554 ha (JRC/EEA).

CMEF indicators: HNVF area is defined on basis of an inventory of semi-natural habitats within Natura 2000 but is recognised as being an incomplete baseline. Work is in progress to develop an integrated indicator using a new methodology.

Identified **CAP support measures** of benefit to HNVF in Estonia:; 212; 213; 214; 215; 216; 224; 311; 321; 322; 323; and State aid.

HNVF in Estonia

HNV farmland in Estonia is predominantly Type 1 HNV with a high proportion of semi-natural vegetation, mainly species-rich grasslands including: coastal and wooded meadows and pastures, Nordic alvars and floodplain meadows, located both within and outside of the Natura 2000 network. The agricultural productivity of these important semi-natural habitats is very low. Until the middle of the 20th century, semi-natural vegetation was the main source of summer grazing and winter forage in Estonia and these habitats were maintained by traditional farm management practices. Unfortunately only around one third of these Natura 2000 habitats in Estonia are currently under some kind of management. WIthout support for the reintroduction of management these important habitats will soon be lost. One of the main issues is that quite a significant area of valuable semi-natural habitats has been ineligible for CAP direct payments and other area-based support.

Future priorities identified by this study

HNV farming systems:

- All livestock dominant HNV farming types related to semi-natural habitats
- Low intensity conventional mixed farming
- Mix farming in mosaic landscapes

Support measures

- Combination of support measures (investment grants, land based management support, advisory services, market supports etc.) is necessary
- Adapted support options (eg infrastructure and access roads for flood plains/wet meadows)
- Improved marketing options for added value products from HNV farms

Rules on eligibility of HNVF for CAP support:

- Remove the limit on the number of trees, define eligible land by grazing or mowing activity;
- Develop realistic GAEC requirements adapted to the qualitative aspects of the pastures;
- Remove the concept of a 2003 reference year; allow farmers to add agricultural land to their claims

Data requirements to enable targeting and monitoring/evaluation:

- MS should propose HNVF related indicators (eg on principles similar to CMEF indicators)
- LPIS should include all information regarding agricultural land including all landscape features, also those larger than 100m^2
- Collect information on grazing animals and on grasslands grazed via GIS and make it publicly available.
- Develop unified inventory of valuable grasslands both within and outside of Natura 2000 network.

FINLAND

HNV farming systems

- **Livestock dominant, Type 1 and Type 2:** Farms that pasture their animals on semi-natural and permanent grasslands, farms with livestock, farms with particularly small field sizes relative to the field area;
- **Arable dominant, Type 1 and Type 2:** Farms with semi-natural grasslands that are mown, and farms with particularly small field sizes relative to the field areas;

Best available estimated extent of HNV farmland: The highest estimate is 1,268,980 ha (JRC/EEA) and the lowest is 259,739 ha (as calculated in a study for the Ministry).

CMEF indicators: Indicator established using MS pre-existing data sets (LPIS). Points are allocated to farms on basis of semi-natural grassland, permanent pasture, density of parcel edges, AE contracts, UAA in extensive uses, livestock farms, bird distribution data. The whole farm (not just the HNVF) is then counted as HNV or not HNV (but wooded pasture is not included).

Identified **CAP support measures** of benefit to HNVF in Finland: 212; 214; 215; 216; Article 68; and State aid.

HNVF in Finland

In Finland, there are no specific farming systems or farm that stand out as HNV. Farms that happen to have remnants of semi-natural grasslands are scattered all over country, can be both livestock and arable and vary in size, although may be larger than average (some farms rent considerable areas managed under agri-environment contracts). Around 30 per cent of Finnish farmland is rented on short-term contracts. Lack of grazing animals in Southern Finland and abandonment of uneconomic family farms in marginal areas is a problem for HNVF management. Most farmland that can be considered HNV is registered on LPIS/ IACS as eligible for CAP support, with the exception of valuable HNV wooded pasture and grazed forest habitats are associated with many endangered species and used to be one of the commonest pasture types in Finland. Although CAP support payments are generally high, farms managing HNV land are likely to be at a competitive disadvantage and agri-environment payments have so far failed to prevent a decline in both the area and conservation status of semi-natural grasslands.

Future priorities identified by this study

HNV farming systems

- Semi-natural grasslands and wooded pastures/meadows in all farming systems

Support measures

- Whole-farm scheme that: prioritises support for low-input, wildlife friendly farming in Natura 2000 areas and in HNV Type 3 areas (eg regular stop-overs of migratory birds) and for farms with production based on traditional/extensive outdoor grazing throughout the season and fodder crops;
- Similar scheme for farms with a minimum threshold (perhaps 30%) of non-cropped HNVF habitats and landscape elements;
- Longer-term scheme (similar to agri-environment but with a guarantee for at least 10-20 years) to encourage farmers to commit to HNVF friendly re-structuring and/or investment, with requirements for different HNV farm types (in some cases based on a farm-specific management plan eg for habitat restoration) and payments adjusted for changes in profit margin over the years; with options for investment, capacity building and training, to support changing from indoor to pasture-based beef production);

Rules on eligibility of HNVF for CAP support

- include wooded pastures/meadows currently outside the EU definition of farmland.

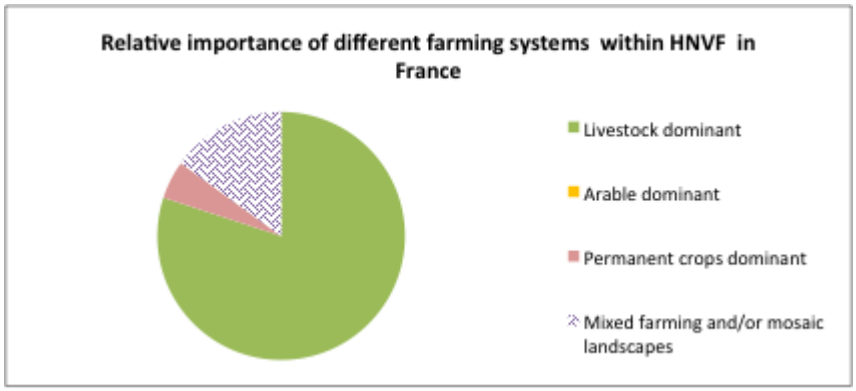
Data requirements to enable targeting and monitoring/evaluation

- Most of the data needed to improve HNV eligibility and monitoring are already available
- Where data is not available on HNV features (eg traditional wooden in-field barns) these can be targeted by management requirements in support schemes, rather than used as selection criteria
- Acknowledge the risks of using data on endangered birds and other species breeding on fields, and on migratory bird stopovers. These are not suitable for scheme control purposes.

FRANCE

HNV farming systems

- **Livestock dominant, mainly Type 1, some Type 2:** extensive sheep/goat grazing mainly on semi-natural non-herbaceous pastures (often Natura 2000); extensive beef systems on grasslands grazed/mown at different intensities; extensive mountain dairy systems on grazed/mown grasslands; low-intensity lowland dairy systems (often organic or PDO cheese) with some cereal/maize fodder crops;
- **Permanent crops dominant, Type 2:** low-intensity olives, chestnuts, some vineyards
- **Mixed farming and mosaic landscapes, Type 2:** Mixed beef/cropping with some areas of extensively managed permanent grassland



Best available estimated extent of HNV farmland: The highest estimate is 7,000,000 ha and the lowest is 4,000,000 ha (estimate of semi-natural farmland based on national land use data TERUTI).

CMEF indicators: No indicator established, but study to define indicator is in progress

Identified **CAP support measures** of benefit to HNVF in France: 211; 214; Article 68; and suckler cow premium.

HNVF in France

Extensively managed pastures and meadows farmed under many different systems of livestock production dominate HNVF in France, but Type 2 HNV landscapes and permanent crops are also significant in some areas. Preventing land abandonment has been a long-term policy goal in France and a very wide range of HNV habitats and features are recognised as farmland of biodiversity value, including non-herbaceous pastures Natura 2000 grasslands, moorlands, alps, wetlands, peat bogs, traditional orchards, hedges, trees and stone walls. Despite this, there is no provision to record these on IACS (although the main grassland agri-environment scheme requires that these and other 'areas of biodiversity value' should be present on 20 per cent of the land). Gradual intensification of HNV grassland management on more productive soils is a more significant threat, and although current environmental support reaches many of these farmers the structure of payments does not provide incentives for HNV management and restoration on the scale required.

Future priorities identified by this study

HNV farming systems

- Extensive livestock systems

Support measures

- Continue targeted and tailored agri-environment schemes, using existing budgets more effectively by linking payments to HNV characteristics
- Introduce a structured grassland scheme to support pasture extensification, distinguish between semi-natural and other grasslands and support restoration of HNV habitats, as an alternative to 'broad and shallow' schemes based on weaker environmental requirements.
- Degressive Pillar 1 support, with higher payments for smaller, more labour intensive farms, payments weighted in favour of land of high environmental value managed by more demanding systems
- Wider use of technical expertise, communication and advice in conjunction with payment schemes.

Rules on eligibility of HNVF for CAP support

- Develop local HNVF identification standards and good management practices, incorporate these in existing HNV inventories and explain to local farmers rationale for including HNVF elements in the eligible LPIS/IACS area.
- Enable farmers to identify different types of HNVF features in LPIS/IACS
- Remove exclusion criteria that have no clear environmental relevance

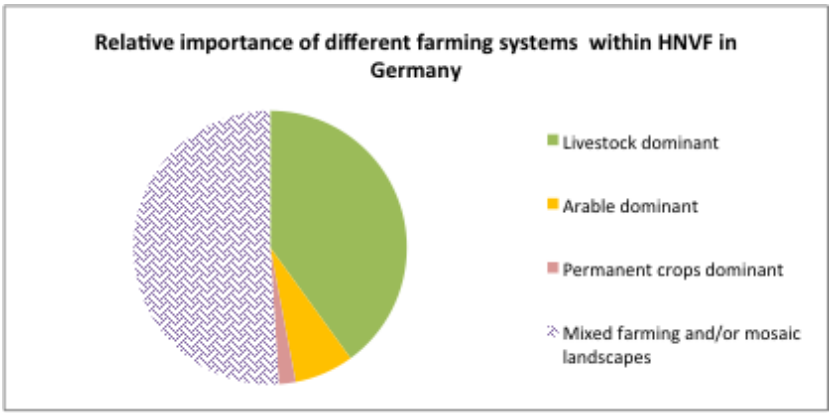
Data requirements to enable targeting and monitoring/evaluation:

- Standards for Pillar 1 farm-level controls differentiated between productive grassland and low intensity HNVF pastures

GERMANY

HNV farming systems

- **Livestock dominant, Type 1 and Type 2:** Sheep and goat farms, suckler cow farms, mountain farms and hay producers;
- **Arable dominant, Type 2, some Type 3:** Nature conservation orientated farms, organic farms, small patches of HNV arable farmland;
- **Permanent crops dominant, Type 2:** Orchard farms and wine farms;
- **Mixed farming, Type 2, some Type 1 and Type 3:** Conventional farms cultivating a mix of arable land and permanent pastures (and partly also permanent cultures), and organic farms.



Best available estimated extent of HNV farmland: 2,201,146 ha (official survey).

CMEF indicators: Indicator established using a new data gathering system created for HNV purpose because existing data sets were found to be insufficient. HNVF area is defined on the basis of a new sample survey of 900 1x1km squares, transects are used to record indicator species (flora) and landscape elements. The survey is repeated every 2 years.

Identified **CAP support measures** of benefit to HNVF in Germany: 211; 212; 213; 214; 215; 216; 224; 225; 311; 323; and LEADER.

HNVF in Germany

Germany is the first (and so far the only) Member State to have devised a new data system to gather qualitative and quantitative on HNV farmland, which provides quite a robust CMEF monitoring tool. Type 1 HNV farmland is mainly extensive semi-natural grasslands in upland areas, mountains and on poorer lowland soils. In these areas farm diversification, direct marketing and part-time farming are common, although there are some large sheep farms in some regions. Type 2 HNV land is mainly on more intensively managed conventional farms. It is estimated that HNV farmland in Germany benefitted from about 16 per cent of the public expenditure under Pillar 2 and less than 3 per cent of the combined Pillar 1 and 2 (2007-9 period).
Regional agri-environment programmes have measures designed for HNV semi-natural grasslands, and these include some results-based payments, with simple self-assessment by farmers of the floristic diversity of their meadows.

Future priorities for CAP support

HNV farming systems

- HNV farms involved in direct marketing and /or processing of added value products (eg cheese)
- HNV farms involved in special bush and scrub management or fertilising management, eg under special result orientated scheme – thus incentivise farmers to ecological innovation
- Well-performing arable farmers with HNV farmland and Ecological Focus Areas, since they are under biggest economic pressures

Support measures

- Targeted agri-environment schemes with attractive payment rates and minor administrative burden
- Result-orientated AE schemes with whole farm and collective approaches (eg types of support for habitat connectivity)
- Support packages for investment aid, marketing support, advice and promotion for HNVF

- Eventually enable certification of HNV farmers

Rules on eligibility of HNVF for CAP support

- Adapt rules to minimise administrative burden (especially on parcels with bushes, fern or scrub) and to facilitate eg the establishment of random strips alongside hedges or in the middle of parcels.

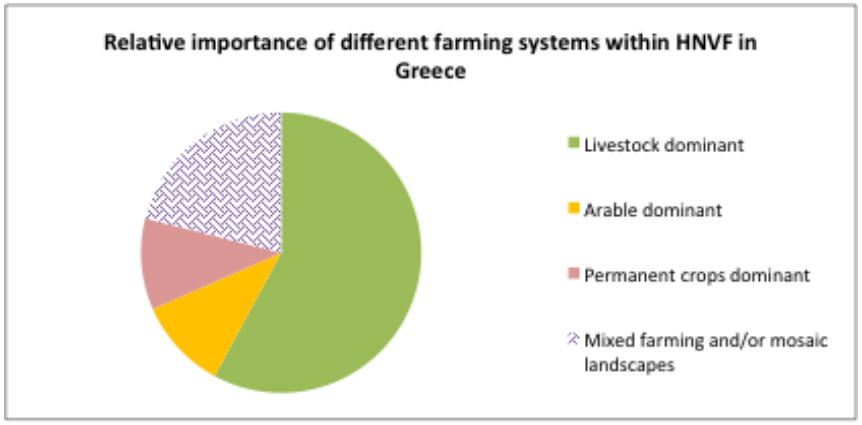
Data requirements to enable targeting/monitoring

- Carry out sample plot monitoring on sub-regional level, integrate with data on extent and quality of parcels and landscape features, ensure iterative process with 1-2 year interval
- Create a simple farm specific data sheet on 'ecological farm performance' to allow for monitoring and evaluation
- Connect economic and ecological data on farms

GREECE

HNV farming systems

- **Livestock dominant, Type 1:** Sheep and goat, suckler cows, and free-range pigs;
- **Arable dominant, Type 2:** Non-irrigated low-input arable crops (cereals, fodder crops, aromatic plants);
- **Permanent crops dominant, Type 2:** Olive groves, grapevines, and other permanent crops including plums, almonds, pomegranates, citrus fruits;
- **Mixed farming and mosaic landscapes, Type 2:** Mixed farming types within a single farming unit: sheep and goat raising in combination with fallow, arable land and permanent crops (alfalfa, vegetables, cereals, olives, vines). Mixed HNV landsapes: Mosaic landscapes with a combination of low-input arable crops and grassland systems.



Best available estimated extent of HNV farmland: 4,467,000 ha (derived from a study for Ministry by Hellenic Ornithological Society using CORINE and species data).

CMEF indicators: Indicator established using target area for agri-environment measures. This is not considered to be a true baseline, and HNVF maps also exist

Identified **CAP support measures** of benefit to HNVF in Greece: 211; 212; 213; and 214.

HNVF in Greece

HNV farmland is widespread in Greece particularly in semi-mountainous areas of limited agricultural productivity which are characterised extensive livestock grazing on communal shrub lands, wooded pastures and semi-natural pastures, with seasonal transhumance still practised in few places. HNV low-intensity non-irrigated arable with high proportions of fallow land, and permanent crops including olive groves, grapevines, are also found in these areas, sometimes traditionally integrated with livestock systems. HNV farms are small and structurally complex with numerous, highly fragmented parcels of cropped land, supporting many Natura 2000 species. More than 80 per cent of grazing land in Greece is in communal ownership, and around 15 per cent of livestock farmers are landless graziers. On the flat lowlands, where farming systems are more intensive, HNV farmland occurs as a mosaic landscape structure in which hedgerows, forested irrigation channels, forest patches trees and flooded fields support significant biodiversity. This spatial fragmentation of the agricultural activities in Greece makes it difficult to delineate 'farmland' and 'farm' in the way that these

terms are use in Northern Europe, and at present the IACS and LPIS datasets do not distinguish HNV characteristics.

Future priorities identified by this study

HNV farming systems

- Sheep and goat mixed farming systems in marginal areas
- Low-intensity arable mixed farming systems in marginal areas

Support measures

- Strengthen existing support measures by linking requirements more closely to HNV practices
- Improve transfer of HNV research knowledge to farmers, especially producer groups and young farmers

Rules on eligibility of HNVF for CAP support

- Define a suitable set of HNVF identifiers for use in LPIS

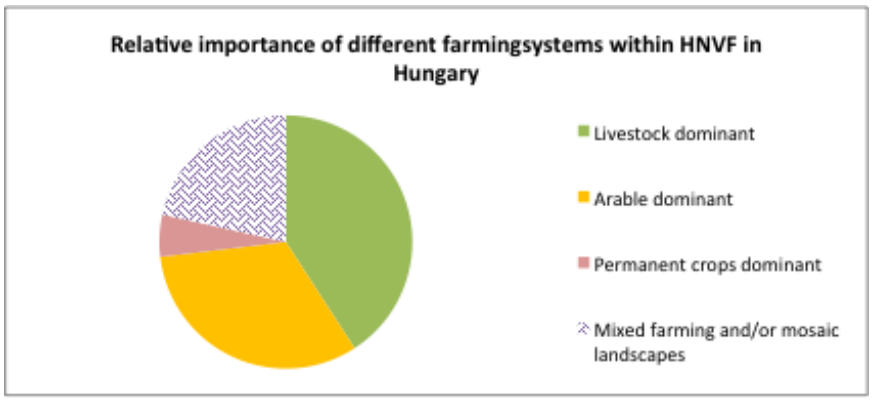
Data requirements to enable targeting and monitoring/evaluation:

- HNVF monitoring using a stratified sampling scheme; expand the existing Farmland Bird Monitoring Scheme

HUNGARY

HNV farming systems

- **Livestock dominant, Type 1 , also Type 3:** Extensive management of semi-natural grasslands with the shepherding and sectional grazing (sheep, cattle, buffalo); agro-forestry systems, wooded pastures;
- **Arable dominant, Type 3:** Low intensity crop procuction on (small and even large-scale) arable lands connected to green infratructure features and ecological corridors;
- **Permanent crops dominant, Type 1:** Traditional orchards, flood-plain orchards;
- **Mixed farming and mosaic landscapes, Type 2 with transition to Type 1 where grassland proportion is higher:** Traditional, mosaic-like and with small parcels, low intensity farming systems (*tanya*)



Best available estimated extent of HNV farmland: The highest best available estimate is 1,935,454 ha (JRC/EEA). The lowest best available estimate is 900,000 ha (RDP).

CMEF indicators: Indicator established using MS pre-existing data sets. HNVF area is defined using protected areas plus species data but the CMEF indicator is in fact the number of farmers in AE schemes within the designated HNVF areas, so not a true baseline.

Identified **CAP support measures** of benefit to HNVF in Hungary: 111; 141; 143; 211; 212; 213; 214; and State aid.

HNVF in Hungary

Hungarian grasslands are typically of low or medium productive capacity. Extensive management is the norm on a wide range of habitat types from saline grasslands of the Great Plain to wooded pastures and extensively managed hay meadows and wet pastures. Almost half of all grasslands designated as Natura 2000 sites. In contrast, the majority of arable land is intensively managed, but large-scale extensive fields are important HNV habitats for highly valued bird species including great bustard (*Otis tarda*). Small-scale HNV arable fields are found in areas of farmland with complex cultivation patterns, scattered grasslands and areas of natural vegetation. *Tanya* is a traditional Hungarian small-scale mixed farming system that still has an important role in shaping and maintaining the characteristic landscape and its diversity of habitats. On flood plains and the

Balaton Highlands traditional orchards are locally important. The decline in livestock numbers over the past 30 years is linked to the decline in the extent of grassland, through abandonment or conversion to arable land.

Future priorities identified by this study

HNV farming systems

- Areas with extensive management of natural/ semi-natural grasslands where shepherding and section grazing is used
- Areas with natural wetland habitats, marshes, mosses and sedges
- Areas with traditional, mosaic-like and small parcels under low intensity farming systems (*tanya* and *szer*)

Support measures

- Agri-environment payments
- Natura 2000 compensation payments
- Payments for non-productive investments
- Integrate different type of payments so that there are no barriers to the continuity of land management activities.

Rules on eligibility of HNVF for CAP support

- Facilitating the eligibility of habitats, hedges, groups of trees, wetlands directly related to HNF farmlands.
- Defining HNVF-specific GAEC requirements.

Data requirements to enable targeting and monitoring/evaluation

- Maintain systems for monitoring biodiversity and habitats at national level linked to HNV designation
- Develop data on changes in the population of species and the habitat use of certain target species primarily linked to HNV farmlands
- Compare this data with the eligible areas and with agri-environment payment commitments.

IRELAND

HNV farming systems

- **Livestock dominant, Type 1 with a transition to Type 2** where the agriculturally improved proportion is higher. (In some cases Type 3, where the area has been agriculturally improved and is used by wintering wildfowl)**:** mountain type vegetation, wet grassland, dry grassland, and wetlands;
- **Arable dominant, Type 3:** Small areas only;
- **Mixed farming and mosaic landscapes, Type 1 and Type 2:** Mosaics.

Best available estimated extent of HNV farmland: 1,154,495 ha (JRC/EEA).

CMEF indicators: HNVF area is defined on basis of the LFA, which includes a lot of farmland in intensive use. A study is currently underway to define an indicator.

Identified **CAP support measures** of benefit to HNVF in Ireland: 212; 213; 214; and Article 68.

HNVF in Ireland

Future priorities identified by this study

HNV farming systems

- Focus on farmed semi-natural vegetation since it is the easiest way to target HNVF land.

Rules on eligibility of HNVF land for CAP support

- Change eligibility criteria to reward farmers for having HNVF land. The main criteria should be the use of the land and the maintenance of vegetation that is not deteriorating. Scrub and trees are compatible with pastoral use of the land, but a *process* of abandonment, shown by gradual scrubbing over and closing of the landscape should be avoided.

Support measures

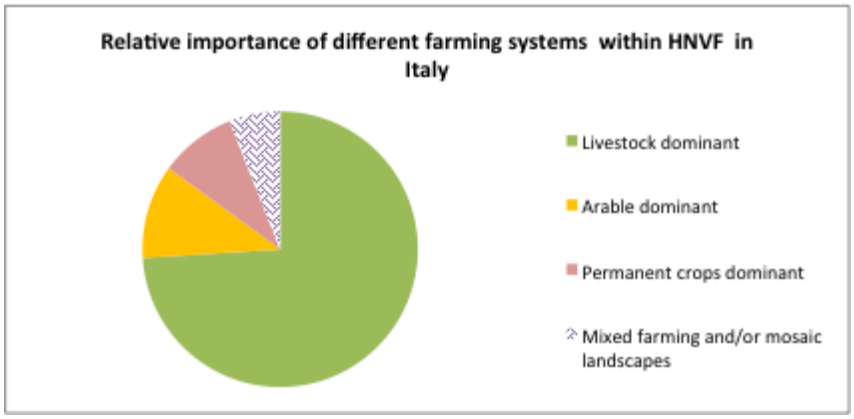
- LFA payments are an attempt to ensure support towards the more marginal farms and in doing so catches the majority of HNVF. However the high percentage of land eligible under LFA means there is little targeting towards HNVF farmland.
- Reconsider recent changes within the LFA scheme in terms of minimum stocking rates, and increase of livestock retention periods from 3 months to 6 months which can all affect HNVF – these changes fail to recognize that the nature of HNVF often means low stocking rates (considered by the new design as inactivity)

- Develop agri-environment schemes targeted at HNV farming.
- Develop outputs-driven agri-environment scheme. Such a scheme should have:
    - A payment system based on a field-based assessment of the environmental condition of each eligible field; thus allowing farmers whose habitats are in the best condition achieve higher returns;
    - Co-funding of site-enhancing environmental investment, for example for scrub control, water supply and fencing;
    - Simplified map- and aerial photo-based farm plans with a high level of farmer input;
    - Well trained and effective knowledge transfer and advisory support service.

ITALY

HNV farming systems

- **Livestock dominant, Type 1:** Mainly located in mountainous areas of the Alps and Apennines, in main islands (pseudo-steppe and semi-natural dry grassland and scrublands). In Sardinia, also, wooded pastures dominated by evergreen oaks. Dry grasslands very widespread;
- **Arable dominant, Type 2, (rice fields Type 3):** Mainly located in northern plains (low, medium intensity rice cropping) and in central and southern uplands (cereals and forage crops under low intensity management, and proportion of fallow);
- **Permanent crops dominant, Type 2:** Mainly olive trees and vineyards under low intensity management and with semi-natural under storey (not permanent during summer in dryer areas). Large old trees (Apulia). Also traditional orchards with understorey. Landscape elements such as dry-stone walls and terraces represent an intrinsic element of this system;
- **Mixed farming and mosaic landscapes, Type 2:** Mainly hilly areas and Central and Southern regions, are mainly constituted by a combination of sheep and goat rearing and cereals and forage cropping. Mosaic of permanent crops and arable (Forages, cereals and ol-ive groves are the main crops). Unfarmed features represent a main characteristic of this system.



Best available estimated extent of HNV farmland: The highest estimate is 6,227,983 ha (INEA land cover estimate) and the lowest is 3,064,322 ha (INEA farming data (FSS) estimate).

CMEF indicators: Indicator established using MS pre-existing data sets. HNVF area is defined separately for each region using its own system for the 2007-13 RDP, variously using CORINE, agricultural statistics and IACS/LPIS. In some cases the methods were changed for the MTE. Refinement and harmonisation is ongoing.

Identified **CAP support measures** of benefit to HNVF in Italy: 211; 212; 213; 214; 216; 221; and 323.

HNVF in Italy

Type 1 HNV farmland is mainly associated with traditional and low intensity grazing systems, whose main characteristics vary across Italy. In Northern regions cattle rearing prevails, with the traditional practice of vertical transhumance called *alpeggio* still in use (although declining). This consists of moving stock during late spring and early summer from valley to mountain pastures (*malghe*). In central Italy, particularly in the Apennines, sheep rearing prevails and there is still some transhumance, consisting of moving flocks during late

spring along sheep paths called *tratturi* to summer pastures (from Lazio region to Abruzzo region, and from Apulia to Molise) and *vice versa* at the end of summer. Traditional grazing systems are also widespread in Sicily and Sardinia. Often semi-natural grazing is managed under common property rights, leading to possible problems of under and/or overgrazing.

Type 2 HNVF includes traditional olive groves and mixed plantations, traditional orchards and vineyards (mainly terraced). It also includes low intensity arable crops with a proportion of fallow or of permanent crops, mainly located in Southern regions, which are also rich in unfarmed features like stone walls, trees (in rows or isolated) or small woods dominated by sclerophyllous oak, carob and/or olive groves, making a mosaic-like landscape. In central Italy (Lazio and Tuscany) there is also *Maremmana* cattle breeding, using scrub and wooded pastures. In Sardinia large areas wooded pastures dominated by evergreen oaks (*Quercus suber, Quercus ilex, Quercus coccifera)* are used for sheep and goat rearing.

Type 3 HNVF is mainly wetlands, including rice fields; when these are managed at low intensity they host communities of water birds of conservation interest such as Little Egret (*Egretta garzetta*) and Night Heron (*Nycticorax nycticorax*), species of amphibians and reptiles (*Emys orbicularis*, *Triturus carnifex*) and typical emergent and submerged vegetation (*Marsilea quadrifolia*).

Future priorities identified by this study

HNV farming systems

- All types of HNVF should be supported
- Give priority, if necessary, to HNVF systems at higher risk of abandonment, whose economic viability is particularly low (eg HNV Permanent grasslands and HNV permanent crops) and to those providing more relevant public goods.

Support measures

- Use packages of measures in appropriate combinations to increase the attractiveness and effectiveness of any individual measure
- Use the most relevant measures for land-based support to HNVF via LFA payments, Natura 2000 payments, AE payments and non-productive investments. Provide additional support via investment aid, investments to support farmers to join food quality schemes, farm diversification, encouragement for tourism etc., improve advice and training measures
- Encourage innovative approaches such as integrated and territorial approaches like that concerning Natura 2000 in Marche, based on collective action and networks (ENRD 2012).
- Involve local communities and potential beneficiaries in the scheme design (for example as in Lombardy in the AE scheme on the conservation of the wetland areas used for rice production) as it improves effectiveness of measures, better environmental results and improved uptake
- Targeting and tailoring of measures and their combination should take regional characteristics into account.

Rules on eligibility of HNVF for CAP support

- Use HNV farm characteristics as eligibility criteria set at farm-level for land-based payments.

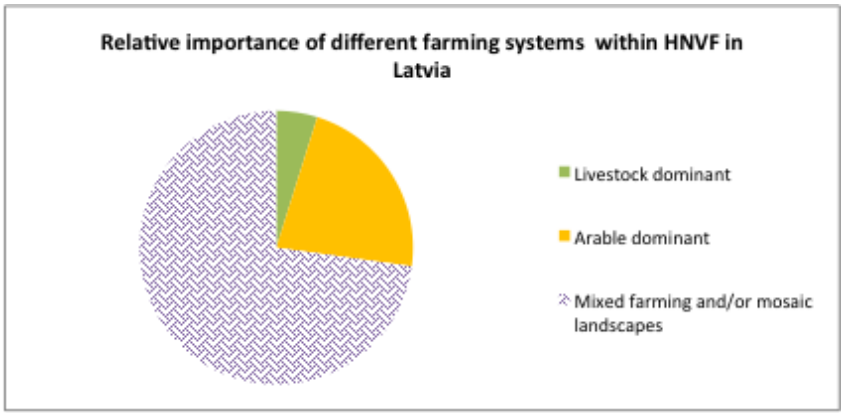
Data requirements to enable targeting/monitoring

- Develop monitoring and evaluation data that allow linkages between type of support and type of HNV farms/farming system. CMEF monitoring tables should include key information on HNV farms/farming systems and, possibly, some environmental information.
- Data collection should be improved by including the spatial distribution of different AE schemes (at least), and possibly other measures.
- A grass inventory with information on grass management and ecological value is needed, to improve targeting of measures.
- Key HNVF characteristics (variables) should be integrated into agricultural statistics (ie Agricultural census, Farm Structure Surveys, FADN) and LPIS-IACS databases. The latter would enable at the same time both targeting measures and monitoring HNVF trends.
- Data should be available on a geographical basis in order to allow analysis based on GIS.

LATVIA

HNV farming systems

- **Livestock dominant, Type 1:** Cattle and sheep keeping on semi-natural and permanent pastures; winter feeding with hay (almost no additional feed);
- **Arable dominant, Type 2 and Type 3:** mosaics or arable crops and landscape elements; large arable fields near wetland Natura 2000 areas.
- **Mixed farming and mosaic landscapes, Type 2, Type 3 and fragments of Type 1:** farms which keep livestock and cultivating fodder crops, different combinations are found.



Best available estimated extent of HNV farmland: 569,534 ha (JRC/EEA).

CMEF indicators: not yet defined, work in progress.

Identified **CAP support measures** of benefit to HNVF in Latvia: 212; 213; and 214.

HNVF in Latvia

The majority of HNV farmland in Latvia is managed by mixed farms with varying combinations of livestock and arable/fodder crops, and also by arable farms, many of them organic. This is mostly Type 2 mosaic with landscape elements, but also Type 3 near Natura 2000 wetland sites, and some patches of Type 1 on the mixed farms. Livestock farms with cattle and sheep grazing, and winter feed provided by hay, manage the relatively small proportion of Type 1 HNVF habitats. These are semi-natural grassland habitats, grasslands important for birds (together classed as Biologically Valuable Grasslands), wooded pastures and other semi-natural pastures and meadows but significant areas of these threatened European habitats are not eligible for RDP support.
The major HNVF trend in Latvia is land abandonment leading to forest succession. Overall, there has been a process of landscape polarisation in Latvia with simplification both at a landscape scale, in the transition between farmland and forest, and at a farm scale with farmers ceasing to use their semi-natural areas for agricultural production. The mosaic-type cultural landscapes of the undulating uplands and river valleys are most at risk. The main driver of grassland management is the availability of RDP payments but a 2011 survey revealed that 40 per cent of the farmers applying for these payments do not use the grass but simply mulch it, and 63 per cent would cease managing the grassland if the payments were withdrawn.

Future priorities identified by this study

HNV farming systems

- Semi-natural grasslands and grasslands, important for birds (about 30 per cent of this subtype is currently outside RDP support and without management, and only 25 per cent is supported and managed appropriately).
- Wooded pastures and meadows and *Juniperus* formations. RDP support reaches a small proportion, but no support is provided for 80 per cent of these silvo-pastoral systems.
- Non-grassland habitats dependent on agriculture including heathlands, dunes and fens, currently with no support.
- Type 2 Farmland with a mosaic of low intensity agriculture and natural and structural elements, with no available support at present

Support measures

- Develop a wider range of agri-environment schemes, both with simple and more advanced requirements
- Support restoration of grasslands and their management through a combination of measures
- Provide agri-environment or forest environment payments to silvo-pastoral systems
- Increase support to maintenance of landscape elements and natural heritage features
- Support restoration and creation of wetlands and riverine areas

Rules on eligibility of HNVF for CAP support

- ALL HNVF land should be formally recognised as eligible

Data requirements to enable targeting/monitoring

- Regularly update mapping of all types of HNV farmland to register changes in habitats and landscape.
- Regularly update map of management practices.
- Carry out surveys of farmers to understand why they change or keep certain management practices.

LITHUANIA

HNV farming systems

- **Livestock dominant, Types 1, 2 and 3:** Extensive beef and dairy systems using semi-natural pastures; and other extensive livestock systems;
- **Arable dominant, Types 1, 2 and 3:** Low intensity arable systems;
- **Permanent crops dominant, Types 1, 2 and 3:** Traditional orchards with grassy semi-natural or low intensity crop understory.
- **Mixed farming and mosaic landscapes, Types 1, 2 and 3:** Extensive grass/arable systems.

Best available estimated extent of HNV farmland: The best estimate for Lithuania is 640,277 ha (JRC/EEA).

CMEF indicators: Natural grasslands, according to the national grassland inventory; areas where RDP measures targeted at biodiversity conservation have been or are being implemented; protected areas (including Natura 2000 network) and various types of wetlands (bogs). Land in RDP measures is a circular indicator rather than a baseline. Work on indicators continues.

Identified **CAP support measures** of benefit to HNVF in Lithuania: 214; 221; 223; 225

HNVF in Lithuania

Extensive livestock systems, mainly beef and dairy, based on HNV semi-natural grasslands used for grazing and hay making. These grassland habitats are quite fragmented, many have been abandoned and those still managed are the focus of targeted agri-environment schemes. HNVF extensive mixed grass and arable farms tend to be small, use fewer inputs than commercial farms and are often managed part-time or by older farmers; on these farms grasslands are mostly mown, but changes in agri-environment requirements to encourage grazing have resulted instead in some of these farmers converting grassland to cropping, attracted by higher per hectare CAP payments. Low-intensity arable systems based on cereal and legume cropping within a mosaic landscape of trees, bushes, small meadows and patches of grassland, woodland and fens are found on poorer soils (about 20 per cent of the agricultural land in Lithuania has not been drained or agriculturally improved). Semi-intensive arable mosaics can be support species of conservation concern. Traditional apple orchards, managed non-commercially and often mown by hand are important for insects, birds and amphibians.

Future priorities identified by this study

HNV farming systems

- Semi-natural pastures
- Unimproved low-intensity arable systems
- Traditional orchards

Support measures

- Ensure that the combination of all CAP payments and requirements at farm level provides an incentive for farmers to maintain HNVF land
- Targeted HNV agri-environment schemes

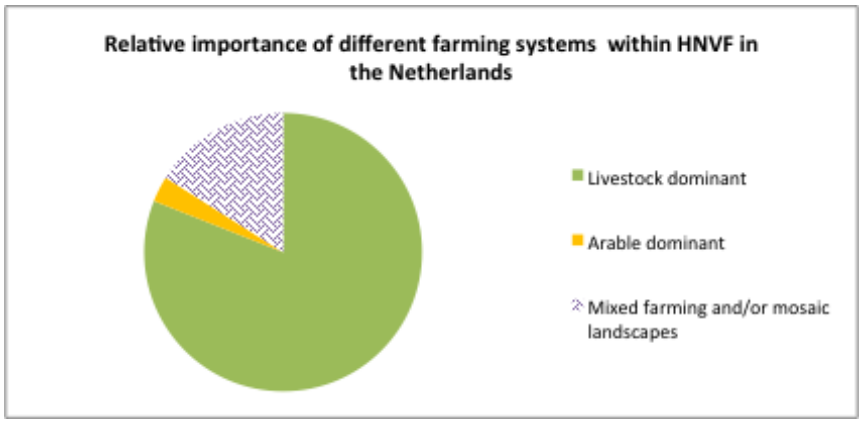
Data requirements to enable targeting and monitoring/evaluation:

- Improved HNV indicator that captures small farm size, rich habitat diversity and areas where agricultural land has not yet been drained/improved

NETHERLANDS

HNV farming systems

- **Livestock dominant, Type 1 and Type 3:** Grass and moorland (semi-natural habitats), and permanent grass;
- **Arable dominant, Type 3:** Dryland arable with a high proportion of fallow;
- **Mixed farming and mosaic landscapes, Type 2:** Permanent grassland on sandy soils with high density of green linear landscape elements (hedges, tree lines), and permanent grasslands on peaty soils with high density of wet linear elements (ditches, ponds).



Best available estimated extent of HNV farmland: 288,235 ha (Alterra study for the Ministry).

CMEF indicators:. HNVF area is defined on basis of the original indicator from JRC/EEA. A new indicator has been developed but at the time of writing had not yet been approved. This is expected to be based on a mix of farming, habitats, species and landscape features data.

Identified **CAP support measures** of benefit to HNVF in the Netherlands: 212; 214; and Article 68.

HNVF in the Netherlands

The Netherlands is one of the most intensively farmed areas of the EU, and the present HNV areas connected to farmland that provides breeding, wintering, roosting and foraging opportunities for breeding and migratory birds. Type 3 HNV farmland is the largest category in the Netherlands make up 50 per cent of what has been identified as HNV farmland. This mainly consists of permanent pastures used for low intensity (by Dutch standards) livestock grazing, which provide habitats for meadow-breeding and wintering birds, often hosting important shares of populations of species of high European and international conservation status. In the upper northeast (Groningen Province) they also consist of extensive arable systems with a high proportion of fallow land.

About 30 per cent of the HNV land is Type 1 semi-natural farmland scattered all over the country, usually in very small patches and often within Natura 2000 areas, maintained almost entirely by extensive dairy, sheep and suckler cow grazing with some mowing and heather burning. They are managed by nature conservation organisations and farmers, sometimes using shepherds who bring their own flocks in to graze the land. Type 2 HNV farmland is the smallest in extent and make up 16 per cent of the HNV farmland area. These areas are situated either on sandy soils with high densities of green landscape elements (eg tree lines and hedges) or in wet peatland pasture lands characterised by a high density of ditches, both managed by extensive dairy grazing systems, possibly with some sheep on the peatland. The farmers on these types of HNV farmland have, for different reasons, not simplified and intensified their farming systems to the same extreme extent as most other Dutch farmers. In the wet peatland areas this is often related to soil moisture levels, for example. The intensity of these systems is therefore low by Dutch standards (although still quite high in a European context).

Future priorities identified by this study

HNV farming systems

- permanent grassland systems in the wetter peatland areas, where breeding birds of European conservation concern depend on a continuation of extensive farming practices.

Support measures

- Improved targeting of both Pillar 1 and Pillar 2 support at the HNV farmland by using opportunities to concentrate Ecological Focus Areas in areas with a high density of HNV farmland;
- Agri-environment and LFA payments should be targeted more strongly at HNV farmland areas and designed to offer coherent agri-environmental management for groups of farms;
- Encourage HNV farmers to organise themselves in cooperatives by increasing payment rates towards cooperation actions. It helps to increase the overall environmental quality of a region (eg lowers nitrogen concentrations in water, facilitates the maintenance of higher water table levels in peatlands, higher levels of green veining etc.).

POLAND

HNV farming systems

No details available

Best available estimated extent of HNV farmland: The best available estimate for Poland is 4,488,811 ha (JRC/EEA).

CMEF indicators: No indicator established, work is underway

Identified **CAP support measures** of benefit to HNVF in Poland: 211; 214.

HNVF in Poland

As a result of historic land use structures farming in some areas of Poland, particularly in the south and east is characterised by small farms and low-intensity management in contrast the intensive farming systems of central and western Poland. These extensive small farms may have a high proportion of meadows and pastures or a mosaic landscape structure; low stocking densities and low rates of fertiliser use; permanent pastures; and grow several different crops if they have arable land. Holdings can be highly fragmented, creating complex mosaics of land management. In some areas HNV habitats are part of unique cultural landscapes of high biodiversity value, for example the grazed wetlands of the Beibrza Valley. The decline in livestock numbers in the past 25 years has led to the abandonment of important pastoral habitats and consequent loss of valuable species, as happened in the limestone grasslands of the Kraków-Częstochowa Uplands where a programme has been set up to restore sheep grazing. Loss of other HNV farmland remains a risk, particularly as farms are enlarged and intensified.

Future priorities identified by this study

HNV farming systems

- Livestock systems using semi-natural pastures;
- Mosaic low-intensity farmland.

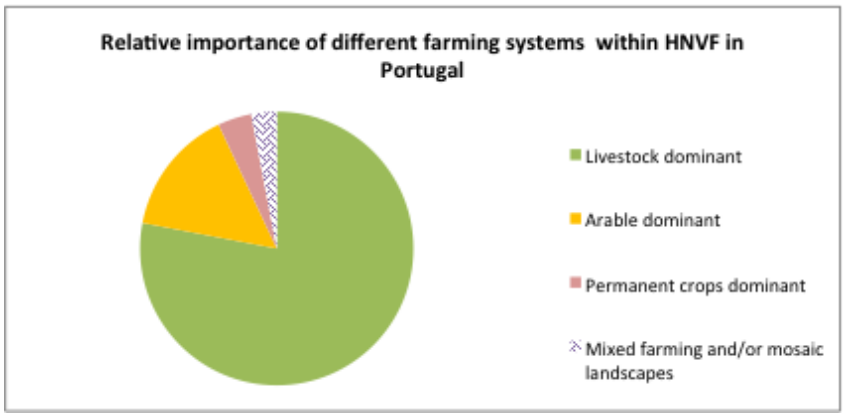
Support measures

- Increase uptake of HNV relevant agri-environment schemes

PORTUGAL

HNV farming systems

- **Livestock dominant, Type 1:** Low-intensity semi-natural grazing (including montado);
- **Arable dominant, Type 1:** Low-intensity non-irrigated arable crops;
- **Permanent crops dominant, Type 1:** Low-intensity permanent crops;
- **Mixed farming and mosaic landscapes, Type 2:** Mosaic areas composed of agricultural and semi-natural areas (traditional mixed farming).



Best available estimated extent of HNV farmland: The highest available estimate is 3,810,878 ha and the lowest is 3,260,110 ha. Both figures are from the work commissioned by the national Ministry. The high figure is the estimate for all HNVF, the low figure is the estimated HNVF within the UAA.

CMEF indicators: Extensive grazing systems including the *montado* wooded pasture system; extensive arable production/fallow land; extensive permanent cultures such as olive groves and dry fruits; high diversity farm land cover systems- mosaic. Combination based on IACS/LPIS data.

Identified **CAP support measures** of benefit to HNVF in Portugal: 211; 212; 214; 216; 225; 227; 311; 323; and Article 68.

HNVF in Portugal

Portugal has two main types of large-scale low-intensity HNV grazing systems. The Mediterranean system of *montado* covers one million hectares of southern Portugal and is characterized by open tree cover of cork oak (*Quercus suber*) and holm oak (*Quercus rotundifolia*) maintained through natural regeneration, with ground layer maintained in a rotation of cultivation, fallow and grazing by cattle, sheep and Iberian pig. These important HNV areas are threatened by increasing grazing intensity using heavier breeds of cattle rather than sheep. In the north of Portugal, irrigated mountain pastures are maintained by a centuries-old system of terraces called as *lameiros*. Both the intensification of these farming systems and, in some regions, particularly their abandonment have been detrimental. A key feature of the low-intensity HNV arable systems is the high proportion of fallow. Traditionally, 30-80 per cent of the land is left fallow every year, some for five years or more, creating a pseudo-steppic (or cereal steppic) landscape of great importance for nature conservation. The Great Bustard (*Otis tarda*) populations in Spain and Portugal are generally associated with HNV fallow land in pseudo-steppic landscapes. Low intensity permanent crop HNV systems include olive groves and traditional fruit and nut orchards, with a semi-natural ground cover. Many of these have been intensified in recent years, except in poorer areas where agriculture is less specialized. Mosaic Type 2 HNV areas consist of very small farms (*minifundio*) with a wide variety of land uses together with natural areas or elements such as hedges, walls and terraces, watercourses and other features.

Future priorities identified by this study

HNV farming systems

- All HNVF, but support to Type 1 *montados* is a priority, to prevent further decrease and degradation of these silvo-pastoral grazing systems

Support measures

- Adapt Pillar 1 measures (coupled support) to needs of *montados*, to prevent increasing grazing rates, ongoing replacement of traditional sheep by cattle grazing and use of heavy non-native cattle breeds
- It is critical to develop AE schemes for HNVF *montados* outside the currently supported areas
- Better integrate HNV needs in AE schemes for Type 2 farmland in Northern Portugal

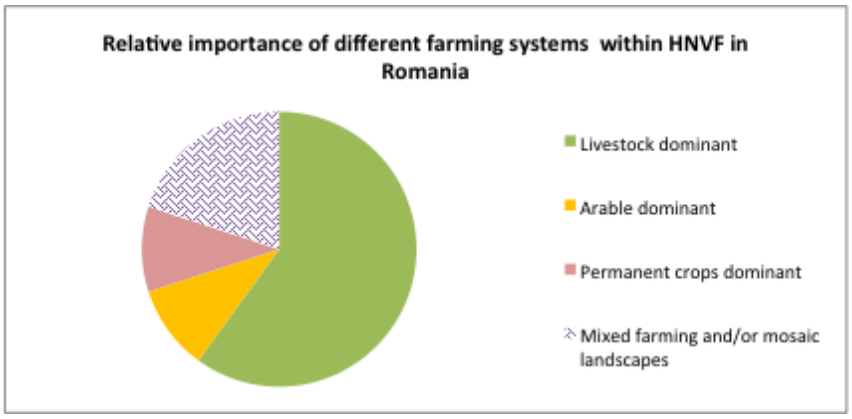
Data requirements to enable targeting/monitoring

- Keep up good progress in developing HNV indicators and mapping approaches and collaborating with researchers and universities on methodologies
- It is an utmost priority to conduct field work to validate the mapping approach
- Examine options to monitor HNV farmland in different time periods

ROMANIA

HNV farming systems

- **Livestock dominant, Type 1:** Mountain – extensive semi-natural pastures, and hilly area pastures, usually common grazing;
- **Arable dominant, Type 3:** Arable areas in southeast Romania with few natural features, declared for migratory birds;
- **Permanent crops dominant, Type 2:** Traditional orchards with mown/grazed permanent grass understorey;
- **Mixed farming and mosaic landscapes, Type 2:** Hilly areas - haymeadows, arable and landscape features mixed at micro-farm level.



Best available estimated extent of HNV farmland: The highest estimate is 5,221,251 ha (JRC/EEA) and the lowest estimate is 3,320,000 ha (RDP).

CMEF indicators: HNVF area is defined on basis of communes with >50% of land area under permanent pasture, but the CMEF figure is quoted in RDP as the target area for agri-environment + LFA which is far larger than the HNVF designated area. Neither is a true baseline.

Identified **CAP support measures** of benefit to HNVF in Romania: 211; 212; 214; 312; 313; 322; and LEADER.

HNVF in Romania

HNV Type 1 extensively managed semi-natural pastures in the uplands are used by extensive dairy sheep systems. The flocks remain up in the hills for 6 months of the year, where they are hand-milked three times a day and milk or cheese sold locally. Arable land and hayfields are usually owned in small parcels, but pastures are owned by the municipality and rented out to village grazing associations for common cattle grazing, or to shepherds managing their own flocks and often other farmers' sheep. Just under half of the permanent grassland in Romania is common grazing land, around 2 million hectares of mostly HNV Type 1 semi-natural habitats. HNV Type 2 in Romania is characterised by small-scale mosaic farmed landscapes, with permanent pastures and meadows, grass leys, patches of arable, wooded pasture and scrub, and traditional orchards. The meadows are large (often 50 hectares) but in multiple ownership where individual patches are managed independently, producing a very diverse habitat. The most important HNV orchards are in the hilly HNV Type 2 areas, where every house has a small orchard and the villages often have larger, communal fruit orchards, mostly abandoned. Type 3 HNV is found on more intensively farmed arable areas of southern and eastern Romania, important for migrating birds.

Future priorities identified by this study identified by this study

HNV farming systems

- Type 2 hay meadows (see low support in 2007-2013 leading to abandonment or change of use).
- Ecological features such as isolated trees, which suffer loss at present.
- Mosaic management under small-scale ownership and management which is key to maintaining these habitats.

Support measures

- Simple HNV grassland support measures with attractive payment rates
- Farm advisory services
- Higher area-based direct payment rates (direct payments and agri-environment) or smaller farmers (up to 5 or 10 ha)

Rules on eligibility of HNVF for CAP support

- Improve HNVF grassland mapping to include currently excluded areas
- Clarify ecological features guidelines so that grassland is not excluded in a perverse manner (for example, owing to presence of trees or rocks)
- Reduce ESU minimum sizes for Measures 111 and 112

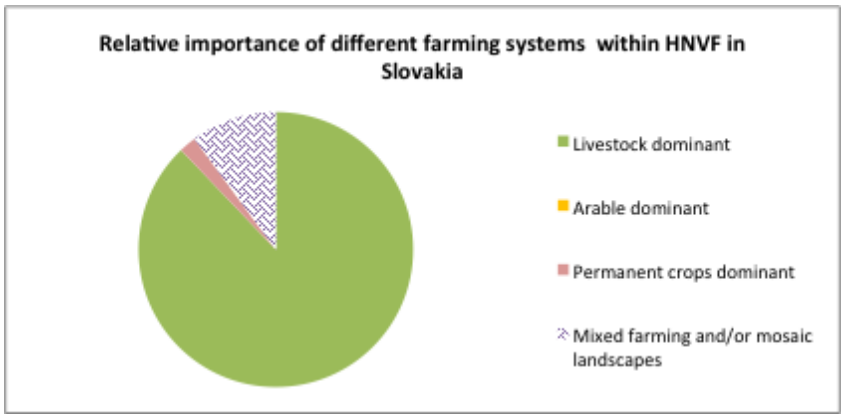
Data requirements to enable targeting/monitoring

- National mapping of HNV grasslands, would correct the errors in the current map of eligible area
- Biodiversity data should be collected on a reasonable sample of farms so that biodiversity benefits of AE schemes can be clearly monitored
- Mountain LFA payments should be linked to good management to avoid support to damaging practices

SLOVAKIA

HNV farming systems

- **Livestock dominant, Type 1:** Semi-natural grassland habitats (pastures and meadows);
- **Arable dominant, Type 2 (could also be Type 3):** Arable land in Natura 2000 sites (potential HNV); Abandoned grasslands (potential HNV);
- **Permanent crops dominant, Type 2:** Traditional Agricultural Landscape vineyards;
- **Mixed farming and mosaic landscapes, Type 2:** Traditional Agricultural Landscape with Dispersed Settlements; Traditional Agricultural Landscape of arable land, pastures, orchard; Traditional Agricultural Landscape of Arable-Land and Grasslands



Best available estimated extent of HNV farmland: The highest estimate is 772,454 ha and the lowest is 364,454 ha. The higher estimate is expert judgement based on semi-natural grassland, mosaics, abandoned grassland and Natura 2000 arable land; whilst the lowest is based on semi-natural grassland and mosaics.

CMEF indicators: HNVF area is defined on basis of a very rough figure produced for 2010 MTE, not considered realistic. Work is underway to establish the indicator.

Identified **CAP support measures** of benefit to HNVF in Slovakia: 211; 212; 213; 214; 224; and 225.

HNVF in Slovakia

Slovakia has large areas of many different HNV semi-natural grassland habitats, particularly in mountain, sub-mountain and floodplain areas. Cattle and sheep production are the main farming systems, with regional difference in farming practices which include continuous or rotational grazing, or mowing twice a year, or a combination of mowing in spring, then grazing until October. Grazing is mostly low intensity of (less than 1LU/ha), and there is transhumance between uplands to valleys (10-20km). Most of these grasslands are farmed by large-scale commercial cooperatives (some managing up to 2000 hectares of HNV semi-natural habitats) and by medium-scale farms, using full time shepherds.

HNV mosaic landscapes are made up of small arable fields, grassland, possibly orchards and (in southern Slovakia) old vineyards, plus buildings and other landscape elements. These are mostly small-scale farms or family farms and the farmers may be part-time (with another job). Managed by traditional extensive farming practices hand mowing and a small number of animals (one cow, a small flock of sheep). Potential HNVF areas include arable land within Natura 2000 areas, which may support important bird species; and the 100,000 hectares of abandoned grasslands which are not recorded on LPIS.

Future priorities identified by this study identified by this study

HNV farming systems:

- Type 1 – semi-natural grasslands defined by National Grassland Inventory (323 000ha) as habitats of biodiversity value.
- Type 2 – Traditional Agricultural Landscape (mosaics of grasslands, arable lands, orchards, vineyards and balks - hedgerows stone walls and heaps, terraces)
- Type 3 – arable land in Natura 2000 sites hosting important bird species

Support measures

- Define 'active farmer' in a way that includes most of the HNV farmers and characteristic farming practices.
- introduce Pillar 1 coupled support (eg animal premia) to a maximum of 8% of the Pillar 1 budget to support HNV farming in areas of low economic viability (eg in mountains) to support farmers / shepherds that have little or no land or land with unsolved property rights. Sheep and goat premia have a particular role to play.
- Use a maximum 5% of the Pillar 1 budget for Pillar 1 LFA support (additional to the LFA support in Pillar 2) for HNVF.
- In Pillar 2 resist the tendency to decrease funds in 2014-2020, particularly the decreased budgets for agri-environment and organic farming, and the proposal to shift 25% of the budget from Pillar 2 to Pillar 1.
- Retarget all RDP instruments to more support for the long-term economic and ecological sustainability of HNV farming systems, eg use HNVF-related criterion for LFA payments and improved advisory.
- Reduce the use of the schemes for basic support and integrated production support and allocate sufficient budget to schemes on natural and semi-natural habitat protection and support of Natura 2000 sites.
- Enhance a regional approach under agri-environment measure by requiring a regional agri-environment plan for all or part of the habitats and species involved, and all individual agri-environment applications to comply with this plan.
- Encourage a collective approach with opportunities for groups of farmers (and other land managers) to apply for agri-environment support.
- Integrate land with unresolved property rights (no existing legal person to take responsibility) and common land in agricultural support policies.

Rules on eligibility of HNVF for CAP support

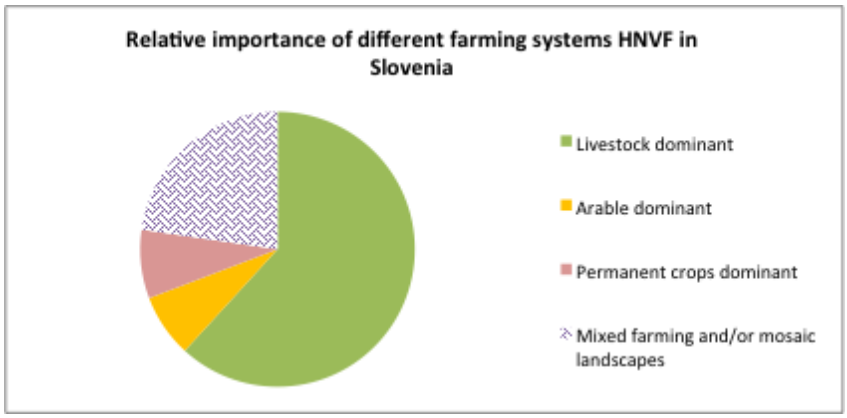
- Integrate the concept of common land and mobile herds within the eligibility rules for Pillar 1 basic payments and all RDP support.
- Enable all HNVF to be eligible, including land with unresolved property rights; and remove the caveat on non-eligibility of land not in GAEC on 30 June 2003 and land failing the GAEC test due to the implementation of Natura 2000 or Water Framework Directive;
- Adapt the permanent pasture definition to HNVF needs.

Data requirements to enable targeting/monitoring

- Update the existing LPIS system, to include currently non-registered HNV areas (100 000 ha)
- Update the Grassland Inventory system of Slovakia to re-evaluate the extent and biodiversity value of semi-natural habitats to prepare a proposal for new HNVF land to be included into the LPIS.
- Define HNV farmers; for this purpose analyse socio-economic data in relation to biodiversity on agricultural land.

HNV farming systems

- **Livestock dominant, Type 1 (Type 3 for intensively managed grassland):** Humid grasslands and marshy land, extensively managed grassland in lowlands, extensively managed grassland in subalpine areas, Alpine pastures (dry open land with special vegetation), intensively managed grassland;
- **Arable dominant, Type 2:** agricultural land under shrub encroachment;
- **Mixed farming and mosaic landscapes, Type 2 with transition to Type 3 in non-terraced areas:** extensive/meadow orchards, Submediterranean agricultural landscape, grasslands with trees, trees and shrubs.



Best available estimated extent of HNV farmland: The highest estimate is 473,116 ha and the lowest estimate is 441,721 ha. The higher estimate is from Ministry calculations of HNVF extent and the lower is the latest calculations for CMEF.

CMEF indicators: the Agricultural Land Use Monitoring database (already used to monitor change 2007-10)

Identified **CAP support measures** of benefit to HNVF in Slovenia: 211; 212; and 214.

HNVF in Slovenia

Slovenian agriculture is dominated by low-intensity livestock systems, often combined with forestry on family farms. The wide range of HNV semi-natural grasslands includes humid, marshy grasslands grazed by cattle or mown; hay meadows and pastures typical of karst areas, managed by semi-subsistence part-time farms, where the main activity may be wine or fruit production (in the least productive areas there some common pastures and also problems of predation by wolves and bears); extensive pastures in hilly areas grazed by cattle and sheep, where the main farm income is from forestry; and transhumance to shepherded summer grazing on alpine pastures, including use of local breeds such as Cika cattle. The intensively managed lowland grasslands used for hay or silage production can be Type 3 HNV. Other HNV areas, which may be a small proportion of the farm, include grassland with trees and shrubs (used for coppicing or fodder) and traditional orchards. Sub-Mediterranean HNV landscapes are mostly terraced with a mosaic of woodland, small vineyards, olive groves, nurseries and orchards.

CAP support is a significant factor in HNV grassland management as the livestock sector declines and there is less demand for natural fodder. The design and targeting of payments is made easier by Slovenia's regularly updated GIS database of farmland, which identifies seventeen categories of agricultural land use, including some, which indicate intensity of land management.

Future priorities identified by this study identified by this study

HNV farming systems

- All types of grassland, with Alpine pastures being most fragile
- Meadow orchards should be maintained.

Support measures

- Rely on detailed calculations of additional costs and foregone income of the farmers in HNVF.
- In the case of low budget, support criteria should be balanced between the rarest or richest HNVF types and the most threatened HNVF types.

- Maintain strict criteria for agri-environment support for the HNVF and scale payment rates according to the HNVF types, since the area of HNVF is vast in Slovenia
- Monitor the conversion of grassland into arable land should be closely in the future
- Focus on capacity building, training and personal advice to encourage more HNVF-friendly implementation.

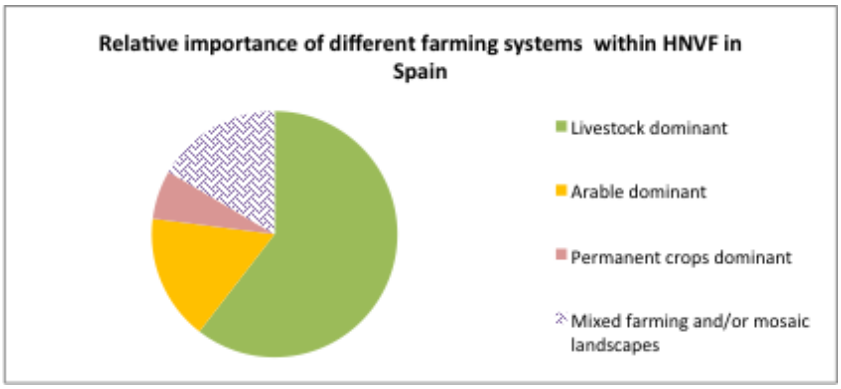
Data requirements to enable targeting and monitoring/evaluation

- Improve databases of different institutions relating to HNVF

SPAIN

HNV farming systems

- **Livestock dominant, Type 1:** Mountain, grass and shrub steppe land, and dehesas;
- **Arable dominant, Type 2:** Dry land arable with a proportion of fallow in rotation and semi-natural elements such as field boundaries. Low-intensity rice cropping;
- **Permanent crops dominant, Type 2:** Traditional permanent crops under low-intensity management with semi-permanent or permanent understorey;
- **Mixed farming and mosaic landscapes, Type 2:** Traditional, small and large-scale mosaics of low intensity farming



Best available estimated extent of HNV farmland: The highest estimate is 25,000,000 ha and the lowest estimate is 14,500,00ha (very approximate expert estimates based on land use statistics and LPIS).

CMEF indicators: No national method has been adopted by the authorities, although some methods explored. JRC/EEA sources are used for the indicator.

Identified **CAP support measures** that benefit some HNVF in Spain: 214; Article 68; and Suckler cow premium.

HNVF in Spain

Separating HNVF from other farmland is difficult in Spain. Except for the main river valleys and coastal areas, most farmland is under relatively low-intensity use, and harbours significant nature value compared with most European farmland. No reliable national assessment of HNVF has been undertaken to-date. Introducing certain additional parameters to LPIS would make it possible to broadly identify and monitor HNVF using this data base.

HNV systems in the many mountain ranges are predominantly livestock farming, and in some regions permanent crops, such as olives. Vast areas of the plains are under a varying mix of low-intensity livestock and arable farming, a considerable part of which can be considered HNV. Spain is unusual in an EU context in having large expanses of HNVF cropland.

Policies to support HNVF are largely undeveloped in Spain. Many regional RDPs draw attention to the importance of traditional low-intensity farming for biodiversity, and stress that abandonment of these systems is a major threat. Some regional agri-environment schemes aim to support these farming systems, but the scale of implementation is insignificant compared with the territorial extent of these systems. The LFA/ANC measure is of marginal significance – although the designated area is vast, only a minority of farms are eligible and the payments are extremely low. SPS is important for many HNV farms, but the historic payments to low-intensity systems are far lower than to intensive farming. GAEC minimum management does not require livestock, only mechanical scrub control, so can be abandoned while receiving SPS.

Future priorities

Types of HNVF to be supported

- Extensive livestock systems using shepherds (bigger challenges than on fenced land)
- Dryland olives, almonds and other tree crops on terraces
- Arable mosaics rich in semi-natural features

Support measures

- Improve basic payments by ensuring all HNVF is eligible and GAEC minimum activity better adapted to HNVF
- Merge LFA and AE schemes into a light-green AE or an LFA payment with some HNVF criteria, to avoid support being too scattered as at present.
- Make available funding for local co-operation projects where farmers can work together with environmental NGOs to solve HNVF issues.

Rules on eligibility of HNVF for CAP support

- All land that is in active use should be eligible, with minimum LU/ha or minimum grazing days.

Data requirements to enable targeting and monitoring/evaluation

- Incorporate basic characteristics in LPIS/IACS (pasture types, fallow, landscape features, all livestock numbers)
- Sample FSS surveys of key characteristics and practices that cannot be captured from data sets
- Design suitable farm-level criteria for AE schemes on HNVF, such as livestock density, grazing regimes, arable stubbles and fallows, permanent crop understorey
- Enforce a logical structure of requirements from GAEC through LFA criteria to agri-environment conditions

SWEDEN

HNV farming systems

- **Livestock dominant, Types 1, 2 and 3:** All permanent pastures and meadows. All additional farmland municipalities with less than 4 per cent agricultural land.

Best available estimated extent of HNV farmland: The best available highest estimate is 1,166,103 ha (JRC/EEA). The best available lowest estimate is 844,400 ha (official Ministry figure).

CMEF indicators: TUVA data base of valuable pastures, meadows and arable land in areas with limited open land. It is founded on field surveys and gradually updated.

Identified **CAP support measures** of benefit to HNVF in Sweden: 214

HNVF in Sweden

In Sweden the HNV focus is on management of meadows and pastures throughout the country, and also on other agricultural land in areas mainly dominated by forest where the aim is to retain farmland biodiversity. The HNV area includes formerly cultivated grassland of biological value or with potential for restoration. Semi-natural pastures and meadows typically have many trees or bushes and also cultural heritage elements such as stonewalls. The most common grassland habitat types are Fennoscandian lowland species-rich grasslands and wooded pastures. Sweden also has a significant proportion of the total area of Nordic Alvar pastures. The main challenge for HNVF is abandonment, leading to overgrowth of scrub and eventually forest.

Types of HNVF to be supported

- Habitats of European conservation importance that were excluded from support under both Pillar 1 and Pillar 2 when Sweden amended the definition of eligible grassland (these include wooded pastures, lowland grassland, dry grasslands and scrubland on calcareous substrates and *Molinia* meadows).

Support measures

- Raise stakeholder awareness of relatively new concept of HNVF

Rules on eligibility of HNVF for CAP support

- Ensure definition of land eligible for CAP support from both Pillars includes all habitats in Sweden of European conservation concern that depend to some extent on agricultural management.

HNV farming systems

- **Livestock dominant, Type 1:** Low-intensity livestock, upland and lowland.
- **Arable dominant:** Arable fields with flora of conservation interest. Low-intensity arable fields can be an integral part of Type 1 Low intensity livestock and Type 2 lowland semi-natural farmland and therefore not included in the estimated proportions of different farming systems.
- **Permanent crops dominant, Type 2:** Traditional orchards
- **Mixed farming and mosaic landscapes:** Mosaic of arable spring cereals with grassland and landscape elements.

Best available estimated extent of HNV farmland: The best available highest estimate is 7,910,000 ha and the best available lowest estimate is 6,590,000 ha (based on Member State case study produced for this report).

CMEF indicators: The figure given is described as an indicative figure and no longer used for CMEF. It is not clear how the figure is produced.

Identified **CAP support measures** of benefit to HNVF in the UK: 212; 214.

HNVF in the UK

The predominant HNV farmland in the UK consists of Type 1 HNV semi-natural pasture under low-intensity livestock systems (primarily sheep and suckler cattle) at the landscape scale. These are mainly upland areas in the north and west of the UK, and feature use of common pastures, local breeds and in some areas, hay meadows. in the lowlands landscape-scale semi-natural farmland is rare, can still be found as grazed saltmarshes, scarp slopes, floodplains, raised bogs, heaths and woodland habitats. Locally distinctive HNV habitats also occur, for example *machair* (involving low-intensity arable cropping) in northwest Scotland. Apart from these examples semi-natural farmland in the lowlands is normally present only as fragmented remnants of semi-natural habitats (largely grasslands) in Type 2 HNV, associated with smaller field patterns and significant presence of landscape features, such as large hedges. Such patterns exist at farm and landscape levels in several areas that have largely avoided intensification due to physical constraints, such as steep slopes. Type 3 HNV Intensively managed farmland supporting particular species of conservation concern can be found at a local level across all of the UK. As in other parts of Europe, the main species associated with this are wintering birds, such as geese, or species such as stone curlew that use specific arable habitats for breeding.

11 Meeting the challenge of supporting HNVF

Key findings

- **The challenge facing Member States is how best to use CAP support in a way that improves the economic viability of HNV farms without compromising their characteristic biodiversity value and locally adapted low-intensity farming systems.**

- **Ensuring that HNV farmers have access to CAP support from both Pillars may require changing Member States' eligibility criteria for minimum farm or parcel size, widening their definition of agricultural land to cover traditional wooded pastures, fens, heathland and all other Annex 1 agricultural habitats and common pastures; recording all HNVF land and landscape features in LPIS/IACS or using sensitively designed pro-rata calculations of eligibility; and allowing all farmland in active use to claim the new Pillar 1 payments, not only land that had SPS/SAPS rights under the old system.**

- **Effective packages of CAP support for HNV farming require two components which work effectively when they come together 'at the farm gate':**
  - **firstly, to ensure the survival of those farms still using whole or partial HNV farming systems will require a combination of direct payments linked to a minimum farming activity, environmentally coupled income payments and capacity building support specifically designed to counter the economic pressures to abandon or intensify characteristic low-intensity grazing and cropping, or to change the use of HNV farmland by afforesting it; and**
  - **secondly, support for more widespread habitat and species management to maintain existing HNVF habitat, and habitat restoration work to restore degraded areas, thereby contributing to the EU and CBD target of restoring 15% of degraded ecosystems.**

- **Providing and targeting cost-effective HNVF support under the CAP requires better data on HNVF land and farms. EU agricultural data sets such as FSS, FADN and IACS/LPIS could be extended and improved to identify and record HNVF variables in a way that would make them more useful in targeting, monitoring and evaluating the impact of CAP support for HNVF.**

- **At Member State or regional level, existing partial environmental data systems on land cover, biodiversity, semi-natural habitats and species could be completed, regularly up-dated and linked to improved agricultural data sets.**

EU targets for reversing the decline in biodiversity by 2020 and CAP environmental priorities for rural development funds up to 2020 both recognise the critical importance of ensuring the maintenance of existing HNVF and the restoration of degraded or recently abandoned HNVF land[85].

Despite these clear EU-level priorities, HNVF farmers are often disadvantaged in two quite different ways. Firstly, many HNVF farmers are at a competitive disadvantage in agricultural markets as a result of the low-intensity farming methods that create and maintain the high biodiversity value that characterises HNVF. This means that many HNVF farms are not economically viable, even as part-time units. Secondly, in many Member States, HNVF farmers are disadvantaged in access to CAP support from one or both Pillars, compared to

[85] Regulation (EU) 1305/2013 (Article 5(4)a) specifically refers to 'restoring and preserving and enhancing biodiversity, including in Natura 2000 areas, and in areas facing natural or other specific constraints, and high nature value farming, as well as the state of European landscapes'.

farmers of more intensively managed land. The reasons for this are complex, and range from the way in which the current (2013) Regulations and associated rules at EU level are interpreted by Member States/regions, to the extent to which they use the flexibility available to them to allocate CAP funding to low-intensity HNVF, to a lack of institutional capacity to design or implement HNVF support.

Underpinning this in almost all Member States is the basic problem of a 'data deficit' in both environmental and agricultural data sets and a lack of spatial, temporal and technical coherence between these data in relation to HNVF priorities. Until this is remedied HNVF land, farming systems and farmers are likely to continue to be disadvantaged in access to CAP support.

This chapter examines the opportunities that the Commission and Member States/regions have to facilitate and support HNVF in terms of improving the economic viability of these farming systems without compromising their biodiversity value, and of providing public support for the production of environmental public goods.

For this purpose there are three related priorities for the Commission and Member States/regions:

- ensuring that HNVF land, farming systems and farmers are eligible for CAP support and are not penalised by rules on 'non-productive' features or by the association of current payment rates with historic (reference period) payment criteria that were linked to agricultural productivity;
- setting priorities and delivering effective integrated packages of support for HNVF from both Pillars of the CAP; and
- monitoring environmental, agricultural and socio-economic changes in HNVF and evaluating the impact of CAP support measures and considering future policy priorities.

The chapter illustrates how Member States/regions might use the opportunities offered by the 2014 CAP reform agreement to design new, tailored packages of CAP support for HNVF. It concludes with a preliminary assessment of the impact that other elements of the CAP reform could have on HNV farmers' decisions.

11.1 Ensuring that HNV land, farming systems and farmers are eligible for CAP support

The first priority is to ensure that HNVF land is eligible for CAP support from both Pillars of the CAP in the same way as more intensively farmed land. This will require, on the part of the Commission, taking account of HNVF eligibility in delegated acts and, when clarifying operational rules, (for example in working documents on the JRC WikiCAP website). On the part of Member States/regions, it will be necessary to make full use of the flexibility offered by all the CAP Regulations to ensure that HNVF farmers are eligible for support. In some cases this could mean defining requirements or rules for HNVF that differ from those for other farmland within the parameters set by EU regulations. Careful consideration of how best to address HNVF needs will have to be an integral part many different decisions and processes that are being made for 2014-20 CAP support, including the following:

Providing effective HNV area-related support payments for small farms and land parcels. Some of the most important HNVF areas in several Member States are landscapes farmed by contiguous small holdings (for example Romania, Bulgaria, Croatia, SE Poland) where the

structural and habitat diversity created by many individual management decisions on many small parcels of land contributes to the biodiversity value. Small holding or parcel size has meant that significant areas of HNVF have hitherto been excluded from CAP support, often because of the way in which national authorities have implemented eligibility rules. Those which are eligible receive low total payments by virtue of their size but nonetheless these are helpful in contributing to economic viability. From 2014 all Member States have the option of setting eligible parcel size below 0.3 hectare and key Member States will have the option of setting the minimum eligible area of the holding at less than one hectare[86]. The reformed CAP offers managing authorities several means of reducing the additional administrative cost of delivering effective support payments to large numbers of beneficiaries, including a separate Small Farmers Scheme (SFS) with an annual payment between €500 and €1,250 (which does not entail cross compliance) and group applications for the Basic Payment Scheme and for LFA (ANC) and agri-environment-climate payments, which also offer the possibility of an additional 30 per cent to cover the smaller farmers' transaction costs. The SFS should help small semi-subsistence HNV farms to access support, but there will only be one opportunity for farmers to opt for this payment, just a few months after the legislation comes into force.

Including HNVF in the farmland and activities defined by Member States as eligible for CAP support.

Many of the problems with non-eligiblity of HNVF land for CAP support revealed by this study have centred around Member States' definitions of land eligibility, where these excluded Type 1 HNV semi-natural pastureland with trees, shrubs and other non-herbaceous vegetation used by grazing animals. The new Regulations offer very clear opportunities to define HNVF land and all Annex 1 habitats dependent on agricultural management as farmed land eligible for CAP support, if Member States choose to do so. In the new Regulation the definition of 'agricultural area' includes *permanent pasture with herbaceous and other species such as shrubs and/or trees suitable for grazing which can be grazed, provided that the grasses and other herbaceous forage remain predominant;* and, subject to a decision by Member States can also include *land which can be grazed and which forms part of established local practices where grasses and other herbaceous forage are traditionally not predominant in grazing areas*. The definition of 'agricultural activity' still includes *maintaining the agricultural area in a state which makes it suitable for grazing or cultivation* but has been extended to include *carrying out a minimum activity on agricultural areas naturally kept in a state suitable for grazing or cultivation*. These changes offer Member States the opportunity to ensure that all HNVF land, including wooded pastures and all Annex 1 habitats dependent on agricultural management, are eligible for CAP support. In addition, with regard to Member States' definition of 'active farmer', the Commission will have the power to define criteria to guarantee the protection of the rights of farmers, including *those cases where a farmer's agricultural area is to be considered as to be mainly an area naturally kept in a state suitable for grazing or cultivation*.

Thirdly and equally important is ensuring that farmers with HNV land have 'payment entitlements', especially if they have never been able to claim direct payments before. For the new Pillar 1 direct payments scheme a Member State can allocate new payment

[86] BG, EL, IT, CY, HU, PL, PT, RO, SI.

entitlements to active farmers who did not claim Pillar 1 payments in 2013[87]. This is an important opportunity to bring currently unsupported HNVF farmland within the scope of CAP direct payments. In some countries, notably Spain, there are very large areas of farmland shown as eligible for CAP on the LPIS, but for which farmers have not claimed support due to lack of SPS rights. The Spanish authorities intend to exclude such land from the new Basic Payment.

The recording and mapping of HNVF landscape features

This has been an issue for some HNV farmers where characteristic scattered features within permanent pasture or boundary features adjacent to parcels have not been recorded as landscape features under GAEC or do not conform to 'standard' definitions of size applied to more intensively farmed land. The new GAEC standard requires *retention of landscape features, including where appropriate, hedges, ponds, ditches, trees in line, in group or isolated, field margins and terraces, and including a ban on cutting hedges and trees during the bird breeding and rearing season and, possible as an option, measures for avoiding invasive plant species. S*ome flexibility will be needed for Member States to interpret these definitions to suit local HNVF characteristics, and it will be important to ensure that such features are included in the land eligible for support under the Small Farmers Scheme, to which this GAEC standard will not apply.

Ecological Focus Areas

The scope of the definition of Ecological Focus Areas (EFA) includes features that are characteristic of many types of HNV farmland - fallow, landscape features, permanent grassland buffer strips and agricultural land along forest edges. This provides an incentive to retain such features (and/or to manage them under equivalent measures) and if Member States choose to implement EFAs on a regional basis could benefit areas of HNVF beyond the limits of the farm concerned.

Ensuring all HNVF land and features are recorded on LPIS, including traditional wooded pasture systems

Member States will have to ensure, from 2014, that LPIS 'contains a reference layer to accommodate Ecological Focus Areas'. Extending the scope of LPIS in this way provides an opportunity to add a separate HNVF layer to LPIS, and to integrate this with other environmental and agricultural data sets, as proposed in section 11.4 below.

11.2 Setting priorities and delivering effective packages of CAP support for HNVF

It is clear from this study that where there is CAP support tailored to the needs of HNFV (although it is rarely defined as such), these are typically agri-environment payments for specific semi-natural habitats or species, co-financed from EAFRD in combination with national or regional funds. In contrast there are relatively few examples of CAP or EAFRD support targeted specifically at improving the economic viability of HNV farms. Where HNV farmers receive Pillar 1 direct payments and ANC payments these may provide a very important contribution to the farm family income, as the examples in Chapters 5 and 8 have shown, but these payments do not secure the continuation of the HNV farming system or the characteristic practices on which the biodiversity value depends because of the way the

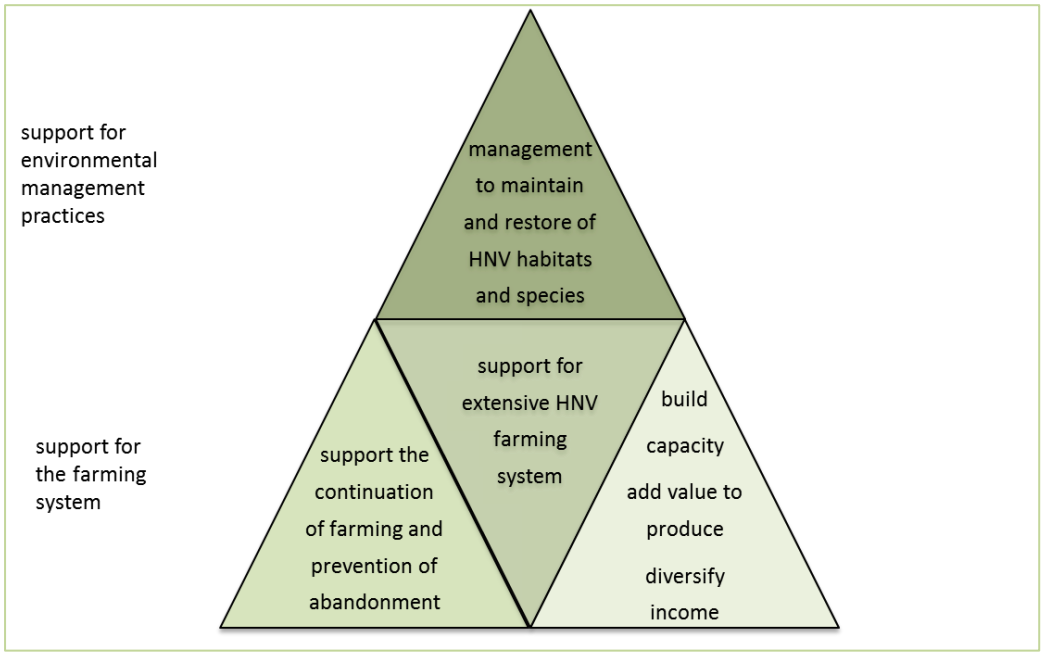
[87] Regulation (EU) 1307/2013 Article 24.

minimum activity is defined, eg mechanical clearance of vegetation rather than minimum grazing pressure.

Where the HNV farming system is not economically viable this problem need be addressed as a priority so there is a more robust basis for targeting support at habitat and species management. In such cases an integrated package of HNVF targeted support is required, as illustrated in Figure 11.1, covering one or both of the following:

- **support for low-intensity HNVF farming systems:**
    - seeking to ensure that farming continues (where there is a risk of abandonment or change of use out of agriculture, for example through afforestation or development);
    - supporting the extensive farming system (to address risks of intensification, for example of grassland);
    - building the capacity of the farm (infrastructure and human capacity), creating new income sources and adding value to HNV produce;
    - supporting longer term strategies involving for example more co-operative working, diversification, investment, structural change with more space for younger farmers.
- **support for environmental management practices**
    - rewarding the maintenance and restoration of HNV habitat and species.

Figure 11.1 Building effective packages of CAP support for HNVF farmers



Not all farms managing HNV land will require multiple support measures if they are already broadly viable in economic terms. The extent and scope of the interventions will depend on the balance of needs of particular HNVF systems, which could for example be targeted through sub-regional schemes. In determining these needs it is helpful to consider from the farmer's point of view the relationship between the HNV land and the farming system within which is managed, as described in section 2.4 above.

The evidence from this study suggests that **whole farm HNVF** farms are most likely to be at greatest competitive disadvantage. To survive, these farms are likely to need support targeted at all the priorities identified in Figure 11.1 as well as longer term structured changes. **Partial HNVF** farms are less likely to be wholly uneconomic and at risk of abandonment, but may need support for maintain extensive farming systems and adding value to produce, as well as specific environmental land management support for their HNVF land. On **remnant HNVF** farms the HNV land is unrelated to the main farming system, generally occupies only a small proportion of the total holding and typically is most at risk of neglect or accidental damage from farming operations (this also applies to Type 3 HNV land on intensively managed farms). For these farms the only support that may be required is targeted environmental management of habitats, landscape features and/or species, but the payment rates/hectare may need to be quite high, to take account of the opportunity costs of high quality land and the costs of management unrelated to the main farm business.

Ensuring that farming continues and land is not abandoned

Basic CAP support helps to reduce the risk of abandonment or change of use out of agriculture, for example through afforestation or development. The Basic Payment Scheme (BPS) can, if Member States choose, be implemented in a way that will address some of the economic disadvantages of HNVF farmers by offering them a BPS which has higher payments for the first 30 hectares, and group application for BPS. The Small Farmers Scheme (SFS) is an alternative for very small HNVF farms.

Most HNVF farming systems are likely to be compliant with the requirements for the Greening Payment (GP) of crop diversification, permanent grassland and Ecological Focus Areas (EFA). Those in Natura 2000 areas will only have to comply with the parts of the green requirements that are compatible with the Natura 2000 site objectives. However, it is essential before the payments begin that the environmental authorities and the paying agencies agree on precisely what (if anything) the farmers of HNVF farmland will be required to do. Equally important is the need to make sure that the farmers understand this, to avoid any possibility of them damaging HNVF habitats (for example by converting extensively managed arable land to EFA) because they believed it was a condition of payment. Recipients of the Small Farmers Scheme will not be required to comply at all, and organic farms are *ipso facto* compliant.

Permanent grassland requirements from 2015

Although direct payments can reduce the risk of abandonment the risk of intensification remains for HNVF on better soils, especially of grasslands such as species rich hay meadows and riparian grasslands they do not prevent intensified grassland management and loss of biodiversity value through increased levels of fertiliser use. The permanent grassland requirements under the Greening Payment do give Member States a new opportunity to encourage farmers to manage their HNVF grassland, if they choose to use equivalent practices for permanent grassland, which could include HNV low-intensity management of both meadows and extensive pastures. Another new option for Member States is to give HNVF semi-natural habitats additional protection by designating 'environmentally sensitive' permanent grasslands, which farmers will not be permitted to convert to other uses or plough up. The effectiveness of this additional protection will of course depend on the extent to which Member States choose to implement it, how they define the grassland to be

protected and whether the threat to the habitat is intensification/afforestation or simply the lack of active management.

One suggestion, which could potentially improve the environmental effectiveness of the permanent grassland requirement, would be to define semi-natural herbaceous and non-herbaceous pastures separately from agriculturally improved permanent pastures in LPIS, provided that an acceptable mapping methodology can be found[88].

Support for the extensive farming system

The revised criteria for LFA (ANC) area designations, to be implemented in 2018 have the potential to refocus this measure on low-intensity farming systems. In the meantime Member States have the option to include LFA (ANC) support in both Pillars. ANC income support payments in Pillar 1 can be regionally differentiated, and funded using up to 5 per cent of the national budget ceiling for Pillar 1. This creates new opportunities for Member States. However, the main consideration for improving the role of LFA(ANC) are the payment criteria, ie which farms within the designated area can receive the payment, with which basic requirements, and what level of payment. For example, current LFA payments in Scotland are heavily skewed to favour better LFA land, criteria in Spain exclude part-time LFA farms. Changes to the boundaries or to the source of the payment (Pillar 1 or 2) do not solve these problems.

The Pillar 2 ANC payments will be within the range €25 to €300 per hectare per year, based on the income foregone and costs incurred as a result of the natural handicap, compared to farmland with no handicap, and would be degressive for farms above a certain size. The comparison requirement is a significant change to the payment calculation which may lead to increased payment rates on some HNV land, compared to the current period. However, this will depend very much on how the comparison is made and what costs are taken into account. In situations where there is a risk of abandonment of HNVF farmland it is important to take the full cost of farming the land into account (Barnes et al, 2011). Guidance on methodologies for calculating payments might be helpful for many Member States.

Building the capacity of the farm, adding value to HNV produce and diversifying

Without improved CAP support in the 2014-20 period, and/or a better use by Member States of the opportunities the CAP offers, or major structural adjustments many HNVF farms will simply not survive. The long-term economic and environmental viability of HNVF farming systems depends on building the administrative and environmental capacity of the farmer and the economic capacity of the farm. The range of capacity building support includes farm advisory services, support for knowledge transfer and information, investment in physical assets, farm and business development, and payments for young farmers. It is essential that the use of these supports is tailored as far as possible to the specific needs of HNVF farmers and farming systems in meeting the environmental objectives. Otherwise there is a real risk that they may be used to intensify existing HNVF farming systems rather than to protect and improve the economic viability of the HNVF system.

[88] European Forum for Nature Conservation and Pastoralism (July 2012) response to the Commission Services concept paper on greening of 11 May 2012.

Farm advice is one issue of particular relevance. From 2014 Member States will be obliged to extend the scope of the FAS beyond cross-compliance and Greening Payment requirements to provide farmers with advice '*where appropriate*' on a lengthy list of topics in four groups: climate change, biodiversity, water, notification of diseases and innovation. For biodiversity the list includes the Habitats and Birds Directives, and support measures for agri-environment, non-productive investments and organic farming. Member States can, if they wish, give certain categories of farmers priority access to the FAS, but they must at least give priority to the farmers who have the most limited access to other advisory services, and must ensure that farmers '*have access to advice reflecting the specific situation of their holding'*. The FAS must also cover '*the sustainable development of the economical activity of small farms*', in particular the beneficiaries of the Small Farmers Scheme.

The proposed scope and requirements for the FAS from 2014 offers Member States an opportunity to provide very specific advisory services tailored to the environmental and economic needs of HNV farmers. However, there is no guarantee that they will do so, or that the advisory needs of HNV farmers will be prioritised over the needs of the much larger group of more intensive farmers, despite the strong steer in the draft legislation that Member States should make an effort to provide recipients of agri-environment-climate payments '*with the required skills and knowledge*'[89].

Investment is another priority. Investment measures have the potential to provide important support to HNVF farming systems, especially when used in combination with tailored diversification and business development measures, for example by improving access to markets. However small and semi-subsistence farmers may not be a priority for investment support and the use of this measure requires overcoming significant challenges, including: the difficulty of individually targeting smaller producers who are not registered; the costs associated with reaching large numbers of very small holdings, farmers' reluctance to co-operate, and the high age and low level of education of many subsistence farmers (Redman, 2010). Stronger support for co-operation may be helpful here.

Many extensive HNVF farming systems would require relatively few changes to meet the standards of organic production. CAP support for organic farming systems could be an important additional source of income support payments for HNVF farmland in those Member States that have large proportions of their permanent pasture under organic systems[90], and also potentially for extensive sheep and goat grazing systems in Mediterranean countries and for HNV arable systems. Guidance to assist organic conversion could be helpful in these conditions.

Supporting the management and restoration of HNV habitats and species
If the economic viability of the farming system is secure, a wide range of range of support is available under Pillar 2 to reward HNVF farmers for the maintenance and restoration of HNV habitat and species.

[89] COM(2011) 627 final/3 Recital 28, page 17.
[90] These include the Czech Republic (over 25%), Greece, Latvia and Slovakia (all over 15-16%), and Austria and Portugal (over 10%) (European Commission, 2010a).

The measure for rural heritage and HNVF management plan preparation offers a very broad range of funding for enhancing or supporting participatory processes to develop HNVF and Natura 2000 management plans, and could be used to a much greater extent to support the development of robust management plans for HNVF areas, using participatory approaches to ensure that stakeholders support the management objectives. When their Natura 2000 management plans are completed Member States will be able to make more use of the Natura 2000 compensation measure to support HNV farming.

Agri-environment-climate payments, along LEADER, remains the only measure that Member States are obliged to implement in their RDPs, and the scope of the measure has been widened to '*further encourage farmers and other land managers to serve society as a whole by introducing or continuing to apply agricultural practices contributing to climate change mitigation and adaptation and compatible with the protection and improvement of the environment, the landscape and its features, natural resources, the soil and genetic diversity. In this context the conservation of genetic resources in agriculture and the additional needs of farming systems that are of high nature value should be given specific attention*'[91].

This is one of the most flexible of all CAP support measures and allows Member States the freedom to address HNV environmental priorities in a way that reflects the great variety of local bio-physical, climatic, environmental and agronomic conditions on HNVF farms. A number of Member States have agri-environment schemes specifically tailored to the management of HNV farmland, which could be used as examples of good practice to be disseminated more widely, for example through the European Network for Rural Development.

Agri-environment-climate contracts are optional for the farmer, and successful uptake depends on payments rates that reflect the true cost to the farmer and within reason provide sufficient motivation for the maintenance of economically unviable farming systems. Agri-environment payments are calculated as the additional costs and income foregone as a result of the management requirements, but the way this formula is used does not address the case of farms with very low farm incomes, particularly HNV upland livestock farms, that are already delivering a high level of environmental management, but which have no income to forego and where there may be no need to change the farming system and thus incur additional costs. Without agri-environment payment rates that also take account of the labour costs and fixed costs of the farming system, the economically realistic choice for these farmers is to abandon farming. It has been suggested that Member States could make more use of the opportunity costs concept to reflect the full cost of continuing HNV farming where there is a proven risk of abandonment or intensification (Barnes et al, 2011; RSPB and Birdlife International, 2011). In addition, a key element of the payment calculation, often ignored by Member States, is an additional payment for the farmer's transaction costs (the time and effort spent in setting up and administering the contract). This can add a further 20 per cent to the payment calculation (30 per cent for group contracts) and make a crucial difference from the farmers point of view, but many managing authorities do not currently add transaction costs for agri-environment payment calculations despite evidence that this can affect uptake (Keenleyside et al, 2012). The

[91] COM(2011) 627 final/3 Recital 28, page 17.

revised EAFRD Regulation emphasises the importance of using transaction costs in future, when farmers enter contracts jointly[92].

Most HNV farmland will be able to meet the eligibility requirements for Pillar 1 Greening Payments, but there could nevertheless be a potential impact on the calculation of agri-environment-climate payments where these overlap with Greening Payment requirements, because of the need to avoid double funding.

There is considerable scope for Member States to make more use of non-productive investment support in conjunction with agri-environment payments for the restoration of degraded and partially abandoned HNVF habitats. Other measure which could be of benefit to HNVF support include the measure for prevention of damage to forests from forest fires and restoring agricultural production potential to maintain grazed firebreaks, and the animal welfare measure.

11.3 New opportunities to use the CAP to support HNVF in 2014-20

Although Pillar 2 is currently the main source of EU funding for specific nature conservation management of farmland, the extent and targeting of support for HNVF farmland varies greatly between Member States. In the 2014-20 such funding will increasingly have to compete with many other rural development priorities at Member State or regional level, and it is more important than ever to build coherent packages of HNVF farmland support using funds from *both* Pillars of the CAP.

The changes to Pillar 2 alter the architecture of the Regulation and hence to the structure of the 2014-20 RDPs which make it easier to use combinations of different measures to support HNVF. Member States can create thematic sub-programmes within their RDPs, showing how they will use the measures available to contribute to these priorities and to address specific needs in their national or regional contexts. The proposed regulation identifies the needs of young farmers, small farms, mountain areas and short supply chains as topics for thematic sub-programmes and allows Member States to raise the maximum rate of support for operations within these sub-programmes.

The LEADER approach has a strong potential to use local action groups to deliver innovative projects for training farmers, to implement beneficial land management at a landscape scale, to develop and implement HNVF and Natura 2000 management plans, and to fund transnational projects aimed at learning about protected habitats that cross borders (Cooper et al, 2006). LEADER complements agri-environment schemes and other nature conservation funding because it focuses on actions strongly rooted in local territories, engages local actors through partnerships, and funds training and innovation.

LEADER has not been used by Member States as a significant funding source for HNVF management measures, and some authorities explicitly exclude activities related to farming from LEADER support, but it can potentially provide substantial benefits by promoting co-operation between local actors and developing integrated projects that combine nature conservation and land use in a sustainable way.

[92] Regulation (EU) 1305/2013 Recital 22.

Table 11.1 below illustrates some of the CAP support measures that could be used to build up packages of HNV support at farm level. Member States with little or no experience of designing and delivering HNVF support, or specific measures, may also need to build their technical, administrative and advisory capacity in these areas.

Table 11.1: CAP measures that could be used from 2015 to create packages of HNVF support

Objective	Pillar 1	Pillar2
Ensure that farming continues	**Basic Payment Scheme** (degressive payments) **Small Farmers Scheme**	
Support extensive farming systems	**Greening Payment** ANC top-up Coupled payments	ANC compensation Natura 2000 compensation Organic farming Genetic resources
Build capacity and add value	**Young Farmers Scheme**	Advisory services Knowledge transfer and information Investment in physical assets Farm and business development Setting up producer groups Quality schemes for agricultural products
Specific conservation management of HNVF habitats, landscape features and species		**Agri-environment-climate** Non-productive investments Animal welfare payments Prevention of forest fires and restoring agricultural potential

(Measures shown in **bold** are compulsory for Member States)

11.4 Monitoring HNVF and evaluating support measures - improving the CMEF indicators

11.4.1 Looking beyond estimates of HNVF extent

The purpose of measuring the extent of HNVF, in the CMEF context, is to be able to monitor changes compared with a baseline situation; and to assess to what extent these changes (or an absence of change) have been influenced by RDP measures. In practice, it is questionable whether the impact of RDP measures can be assessed robustly by monitoring the extent of HNVF during the course of the RDP period.

In fact experience in several Member States/regions suggests that it is not possible to produce a baseline figure of the total extent of HNV farmland with sufficient reliability to be used as the basis for monitoring change over the RDP period. Rather, the overall baseline extent can be considered as indicative, while HNVF monitoring should be built on a basket of other complementary indicators concerning farming characteristics and biodiversity. This was a key conclusion of the EENRD Thematic Working Group on CMEF indicators (EENRD, 2010).

Maps of HNV farming based on the JRC/EEA approach of land cover + species/habitats designated areas are not designed for monitoring tendencies in HNVF at the level of a programme area. The boundaries of IBAs, PBAs and Natura 2000 sites are unlikely to be altered during the lifetime of an RDP, so effective monitoring would need to focus on changes occurring to the HNVF *within* these sites.

In some countries with highly developed land cover and species data, effective calculation of the extent of certain types HNVF may be possible with this combination of national data. However, the slow pace at which it is possible to refresh the complex data involved means that it is unlikely to be possible at intervals during an RDP period. Also, this land cover + species approach will not shed light on changes taking place in HNV farming or forestry systems and practices, or how these have been affected by RD programmes.

Furthermore, any single programming region is likely to contain several types of HNVF, each with particular characteristics. A single figure combining an estimated extent of all different types is not a sound basis for evaluating the effects of a programme.

For monitoring to be useful in practical terms (ie to inform the design of future RDPs), it is essential to gather information on the range of HNVF, with its particular characteristics. It is important to know the trends in extent and condition of key land cover elements discussed in the land cover approach above, and also in the farming characteristics and practices most relevant to HNV as discussed. This is a necessary basis for assessing the effects of RD programmes.

The precise method and combination of indicators will depend on the data, resources and preferences of each Member State. Approaches should be appropriate to the region. In some regions, HNVF systems cover entire landscapes, and require quite complex sets of indicators for effective monitoring. At the other extreme are regions where HNV farmland is limited to small areas that can be defined relatively clearly and monitored more simply.

In any given region, different approaches and methods for estimating the extent of HNVF are likely to produce significantly varying results. This reflects the reality of data sources that are far from perfect for the purpose. It is therefore advisable to try to capture a complete picture by approaching the question from a range of data sources and angles, and not to rely on a single approach.

Maps showing the distribution and approximate extent of different types of HNV farmland may then be combined with data on farming systems to provide the context for developing more specific indicators for each HNV type. The use of complementary sample surveys, as applied in Germany, is a suitable approach for monitoring these specific indicators.

Bringing together current practices and discussions of the Thematic Working Group meetings that informed EENRD (2010), the outcome would be a monitoring system at two levels (regional/national data + sample surveys) as follows:

Regional/national level – gathering available data on land cover and farming practices:
Realistically, the best that can be achieved in most regions at present is to build an approximate picture of the extent of HNVF in a region, or the extent of the most relevant characteristics, by drawing on the land cover and farming data that are available.

These may provide a basket of separate but complementary estimates of extent. Thus, land cover data will give one picture, and farming practices data will give another, complementary picture.

Data may be managed in statistical format, for example giving a figure for each indicator per municipality; they may also be translated into maps to help visualise the territorial distribution of HNV characteristics.

As a minimum, this regional data gathering should aim to provide indicators of:

- The extent of key HNVF types, if data on these are available, such as semi-natural pastures, meadows and orchards (potentially available from national inventories).
- The extent of farmland or farms with key HNVF characteristics, such as low livestock densities, high density of field boundaries and/or other landscape elements.
- The extent of HNVF with the presence of suites of indicator species that may be monitored to help with assessing the biodiversity condition of HNV land.

Sample surveys:
For sub-regional HNVF systems, a set of indicators can be defined, preferably including at least one biological and one farming system indicator, to use in monitoring the impact of RDP measures on that system.

A sampling programme would monitor the baseline condition of each of these indicators and, as a minimum, repeat the sampling in the final year of the programme. Sample surveys would be designed to ensure full representation of the range of HNVF systems in the programme area.

Sample surveys should aim to monitor a range of HNV characteristics:

- Trends in key HNVF practices, including input use, and practices such as shepherding, transhumance, management of arable fallows, late hay-cutting, management of understorey in permanent crops.
- Trends in the extent and condition of key types of semi-natural land cover, included small features such as hedges, patches and ponds.
- Species populations, covering a range of species associated with the local HNVF system.
- Monitoring the socio-economic situation of HNVF holdings is also extremely useful for subsequent assessment of the effects of RD programmes (this aspect is not a specific sub-indicator for HNV in terms of CMEF requirements).

Overall, sample surveys seem essential for assessing the effects of RD programmes on HNVF.

11.4.2 Data requirements and collection

The inadequacy of currently available data sets is a major hindrance to effective identification and monitoring of HNVF. However, this is not solely a problem for implementation of HNVF indicators; it is a reflection of the overall inadequacy of current data for monitoring trends in farmland biodiversity, and for assessing the drivers of these trends. The availability of data on farmland habitats and species is extremely patchy at present, with considerable geographical gaps, taxonomic gaps and time-series gaps. Only bird species are monitored with a degree of consistency across the EU, and even in this case considerable inconsistencies are reported.

There are many partial data systems in existence at Member State/regional level that, if completed and regularly up-dated, would transform the ability of authorities to monitor HNVF and farmland biodiversity in general. These include inventories of semi-natural farmland habitats and species surveys. Butterfly monitoring provides a clear example of a partial system with concrete gaps, for which concrete proposals exist of how to establish a complete EU-wide system[93].

Land cover data sets also have the potential to be better adapted to the needs of HNVF identification and monitoring. New developments in remote sensing are reported from a case study in Wales (UK), that make it possible to distinguish semi-natural farmland in many situations without a field visit, as in the case of the new Habitats Inventory of Wales[94].

Apart from biodiversity data, further development of existing farming databases is an important consideration for the future of HNVF monitoring. It would be desirable to incorporate HNV variables in existing databases, especially in FSS and IACS/LPIS, including:

- Parcels consisting of semi-natural farmland, including traditional orchards and hay-meadows, and smaller features such as hedges and ponds.
- Common grazing land used by the farm (area used in hectares or LU grazing days).
- All forage land used by the farm (including scrubby and woody forage).
- All grazing livestock present on the farm.

First steps towards testing the incorporation of these data could be taken for the sample-survey sites, especially for LPIS.

[93] http://www.efncp.org/download/VS2012-012_Developing_butterflies_as_indicators_in_Europe.pdf
[94] http://www.efncp.org/projects/united-kingdom/carmarthenshire/

12 Conclusions

This chapter first summarises the findings of this study then discusses options for making more effective use of CAP funding for HNVF support.

[Note: HNV farmland in this study refers to land still managed or recently abandoned by predominantly low-intensity farming systems. It does not include habitats or landscape features recently created on land that has been intensively farmed.]

12.1 HNV farming in the EU

12.1.1 The continuation of HNV farming is essential to achieving EU biodiversity targets

High Nature Value Farming is a comparatively new term used to describe the most biodiversity rich farming systems in Europe, which until recently were still widespread across much of the EU. Intensification and simplification of farming systems on more productive land and abandonment of marginal land led to the large scale loss of HNV farming systems and land management. HNV farmland survives only as remnants in many regions, especially the lowlands of northern and north-western Europe, although it is still much more widespread in southern and eastern Europe, including in the more mountainous regions.

It will be extremely difficult to meet the EU 2020 Biodiversity Strategy targets without maintaining appropriate management of the remaining HNV farmland on a large scale within the EU, not least because 57 semi-natural habitat types of European Importance depend on or are associated with low-intensity HNV farming. Significant areas of these and other HNV semi-natural habitats lie outside the Natura 2000 network and have very limited legislative protection. Maintaining the integrity of HNV farmland with a mosaic of low intensity agriculture and natural and structural elements, which provide landscape scale habitat diversity and connectivity, depends on the farm management decisions of many individual farmers. The processes of abandonment, intensification and structural simplification lead not just to the irreversible loss of HNVF biodiversity (unless remedial action is taken very quickly) but also loss of the understanding and skills associated with HNVF farming systems and practices. Economic and social pressures are an increasingly severe and present threat to the survival of millions of hectares of environmentally important long-established HNV farming systems, especially in southern and eastern Europe, where HNV farming is more widespread but still in the process of decline.

The only significant EU source of support for HNV farming systems is through both Pillars of the CAP and this is likely to remain the case until 2020. The way in which Member States use their CAP resources in 2014-20 to secure a stable future for HNV farming systems is therefore of critical importance to achieving EU policies for biodiversity, and has an impact on other environmental policy areas and on rural employment.

12.1.2 Characteristics of HNV farming are not captured sufficiently by EU and Member States data sets

All Member States have made some effort to identify the extent and location of their HNV farmland, many of them undertaking bespoke research because sufficient relevant data was

not available. HNV semi-natural habitats have generally proved easier to identify, particularly in Member States with detailed habitat inventories such as the Czech Republic, Sweden and Slovakia. The identification of low-intensity HNV landscape mosaics has been a particular challenge. Most Member States are still at the stage of having several figures derived from different methodologies and data sets which means that it is not yet possible to produce a single reliable EU-28 figure for the total extent of HNV farmland. Nevertheless there have been some imaginative and interesting approaches, using combinations of different agricultural and environmental indicators characteristic of HNVF within Member States.

The work on HNVF identification has demonstrated that HNV farmland is not captured adequately by either existing environmental or agricultural data sets. There are several reasons for this: habitat and land use data may be incomplete and out of date; intensity of farming use of land is very rarely recorded in LPIS, only land cover; HNV farming systems may be using land not recognised as UAA (including wooded pastures and communal grazing land); and the modest economic size of some HNV farms means that they are excluded from farm economics data sets. The lack of coherent and comprehensive HNVF data, and the limited analysis of the challenges facing these farming systems contributes to the problem of agricultural research that tends to ignore HNV farming.

There is a need to improve data collection and to find ways of integrating biodiversity data about land cover and the conservation status of habitats and species with agricultural data about the type and intensity of land management and with socio-economic data about the farming system. For targeting, monitoring and evaluating HNVF support such data is most useful if it can be disaggregated at the level of the land parcel and farm, and if it can be updated regularly. Existing data systems are close to achieving this, but fall short in certain crucial aspects. A new strategy for valorising and developing current and emerging data sets could be developed to address the problem in a cost effective and robust way.

12.1.3 HNVF farms can be at an economic disadvantage in competitive markets

Whole farms or farmed landscapes managed by HNV farming systems are the most valuable for biodiversity because of their diversity of scale and timing of land management, habitat structure and connectivity, and the species present. The inherently low productivity that defines and determines this high biodiversity value also disadvantages these farm businesses in contemporary agricultural markets. HNV farming does not exhibit the characteristics of large-scale uniform production and tightly integrated supply chains which led to lower costs and standardised processing of agricultural commodities. This competitive disadvantage can be ameliorated only to a certain extent by, for example, cooperative processing and marketing, uptake of information technology and improvements to infrastructure.

The ‘wholly HNVF’ farms are often the most vulnerable to market pressures and require support to improve and maintain the basic economic viability of the HNV farming system, not just for habitat management. In contrast, at the opposite end of the HNV farmland spectrum, there are economically prosperous, usually intensively managed farms with patches of HNV land unrelated to their main farming system, where support for conservation management may be all that is required. These differences in the significance

of HNVF within the farming system have important implications for the mix of CAP policy tools required in different situations. For example, detailed case studies indicate that wholly HNVF livestock farms are not well supported by the CAP in the examples from Spain and the United Kingdom, where SPS and LFA payments still reflect historic differences in the stocking capacity of the land and the lowest payment rates go to the least intensively stocked but most economically marginal HNV farms that are managing semi-natural pastures of high biodiversity value. The situation is better in Romania, where SAPS payments are flat rate and there is a substantial agri-environment programme targeted at HNVF livestock systems.

12.1.4 Time is very short, economic pressures threaten significant areas of HNVF especially in Eastern and Southern Europe

The principal drivers of decline in HNV farming in the EU are socio-economic forces from both within the agricultural sector and the wider rural economy. These pressures will continue to intensify and there is clearly a need to address the socio-economic challenges faced by HNV farmers and farming systems at the same time as addressing the environmental land management issues, since the two are closely linked.

To safeguard the biodiversity and other environmental benefits of existing 'whole farm' HNV farming systems in most cases means achieving more realistic household incomes and reward for HNV farm family labour and making HNV farming economically attractive to a younger generation of HNV farmers. This will not be easy, especially in the case in the poorer rural regions with high unemployment and an ageing HNVF farm population, or in the many regions where the opportunity costs of farm labour can be expected to rise as a result of other rural and regional development measures aimed at reviving the rural economy. Innovative approaches to establishing strengthening the economic and social viability of HNVF are required almost everywhere. There is scope within the broad range of CAP measures available to Member States to support *both* part-time or semi-subsistence HNVF delivering high biodiversity benefits *and at the same time* other non-farm rural businesses and jobs in a way that is economically and socially viable.

In more intensively farmed areas HNVF may be reduced to patches of habitat within a landscape of lower nature value, managed within farming systems which are not HNV. Here there are less likely to be related socio-economic problems and future support may simply require the recognition of HNVF land as agricultural land, and targeted support for habitats, species and landscape features.

12.2 Current CAP support

12.2.1 Some HNV land and farmers have been excluded from basic CAP support widely available to most farmers

Across the EU there are significant areas of HNVF land in active agricultural use, including thousands of hectares of Annex 1 habitats of European importance, that have not been eligible for CAP support in 2007-13. This includes semi-natural grasslands, wooded pastures, heathland, dunes, fens, *phrygana* scrub and pseudo-steppe that are not recognised by the managing authorities as being in agricultural use, or that do not fall within their criteria for 'permanent grassland', or are common land, or failed to meet GAEC standards in 2003 and

remain excluded. This is often because of fear of disallowance, a threat which can be seen to motivate risk-averse behaviour in many national governments and their paying agencies.

HNVF pastures with naturally occurring scrub, trees and rocks were excluded because some Member States interpreted very strictly the GAEC standard for 'unwanted vegetation' and Commission 'guidance' that eligible land should have no more than 50 trees per hectare. HNV farms in some Member States are disproportionally represented in the smallest size group of farms and of parcel sizes, and many of these are 'off the CAP radar', cannot claim support payments and do not benefit from extension and advisory services. For example, the administrative solution to delivering support to very large numbers of small famers in Romania excludes biodiversity-rich mosaic HNVF landscapes of micro-holdings unless these farmers form associations; in Bulgaria the LPIS data base defines large areas of HNVF permanent crop land, pastures and meadows as 'ineligible' for CAP support, while almost all the intensive arable land in Bulgaria is eligible. In Spain, the several million hectares of semi-natural pastures that currently are eligible for CAP support (but in practice are unclaimed because the graziers' have insufficient SPS entitlements); from 2015 this land will be excluded from the new BPS payments that replace SPS.

There were a few examples in the case studies of Pillar 1 support specifically linked to HNVF farming systems or more broadly to livestock grazing systems, using Article 68 and coupled Article 111 payments.

12.2.2 CAP payments that contribute most to HNV farm incomes are seldom targeted at maintaining the characteristic farming systems on which HNV biodiversity and landscapes depend

Wholly or partly HNV production systems are often low-intensity farming systems on marginal agricultural land that operate at a net loss if land and labour costs are taken into account. CAP payments are a vital source of income to offset poor business returns and can represent more than 100 per cent of total farm income, suggesting the possibility of strong policy leverage on the way this land is farmed. However, if the CAP support for the farm is insufficient to cover the losses and is mainly in the form of decoupled income and LFA support, with only a small proportion linked strongly to the HNVF system through agri-environment, Article 68 or similar environmental payments, there can be a perverse incentive to *scale down* the HNVF system while retaining CAP payments, as the detailed study from Scotland shows clearly.

LFA payments are clearly of benefit to some HNVF *farm incomes* in the mountains and other marginal areas, but are generally implemented in a generic way and rarely targeted at supporting HNVF *farming systems* and *practices.* In some (but not all) Member States LFA payments ensure a minimum level of grazing; elsewhere LFA payments have been replaced by agri-environment payments with more stringent environmental requirements.

12.2.3 Carefully designed and targeted agri-environment support in 2007-13 did not reach all HNVF

The '*preservation and development of HNV farming and forestry systems and traditional agricultural landscapes'* was a strategic priority for environmental land management support in the 2007-13 RDPs, backed up by new CMEF requirements for monitoring and

evaluation. Most Member States have so far failed to implement the CMEF requirements for HNV farming and forestry. The lack of monitoring data and the generic way in which EAFRD and other CAP expenditure is reported at present makes it impossible to quantify HNVF specific annual expenditure, even within agri-environment programmes and the Natura 2000 measure. This is true of the data available at the EU level, and also at Member State level in many cases.

The case studies revealed some very good examples of carefully designed and targeted HNVF agri-environment schemes within wider agri-environment programmes. Some of these sub-schemes are for the conservation management of specific HNVF habitats and species of European importance, including those within Natura 2000 sites. Others are designed to support characteristic elements of HNVF farming systems, such as low-intensity seasonal livestock grazing on semi-natural pastures with shepherding, management of species-rich hay meadows, and the use of locally adapted breeds of HNV livestock and crop varieties.

However, this study found are striking differences in the scale of implementation of HNVF agri-environment schemes, particularly in some Member States with very large areas of HNVF land. In Romania the majority of HNVF grasslands are now participating in such schemes, whereas in Aragón (Spain) agri-environment payments for meadows and pastures do not reach vast areas of grassland and arable HNVF, including most of such land within Natura 2000 sites.

12.2.4 Limited use was made of other EAFRD measures to support HNVF in 2007-13

There is apparently limited use of the EAFRD measure that provides aid for non-productive investments to support the restoration and maintenance of landscape features or initial restoration work on recently abandoned HNVF land. In a few instances restoration work is funded from non-CAP sources, mainly state aid.

EAFRD support for organic production is available in most Member States although the majority of HNV farms are not registered as organic, suggesting that there is relatively low uptake of this support among HNVF farmers.

Many Member States allocate substantial funding to Axis 1 measures within EAFRD to build up the economic viability of farms. However, the research did not find examples of these measures specifically targeted at the needs of HNVF (apart from a few examples where farmer training linked to agri-environment implementation may have been EAFRD funded). It is of concern that many of these measures, including support for young farmers could have the effect of undermining the biodiversity value of existing HNV farming systems if the focus is on increasing productivity through intensification, not on improving the economic viability of existing HNVF production systems.

There is an evident need in many Member States to improve the provision of advisory services focused on HNVF and the quality of knowledge transfer, especially where CAP support influences the biodiversity management of valuable HNVF habitats, species and landscapes. There appears to have been little focus on HNVF in Member States' use of RDP

measures for improving the quality of life and diversifying the rural economy, or the LEADER approach.

12.2.5 There is a substantial gap in the use of CAP funding for HNVF that needs to be filled in 2014-20 period to halt the further decline of HNV farming in the EU

It is clear is that in some countries and regions there are landscapes dominated by HNV farming systems, in which the main farming activity is responsible for maintaining high nature values. These are the most biodiversity rich agricultural areas in the EU but the farms are amongst the most economically uncompetitive and are at risk of abandonment or intensification before 2020. This has become even more urgent with the accession in 2013 of Croatia, which has large areas of HNVF farmland at risk of or already suffering from abandonment.

As a result of the limitations of current data it is not possible to provide an accurate estimate of the gap in CAP support for HNVF. The study trialled two very different approaches to assessing the scale and type of change required but additional work is required to establish the farm-level support needed in different Member States and regions. Assuming a commitment to meeting EU biodiversity targets, the first approach estimates that the *additional* cost at EU-27 level of maintaining and restoring semi-natural habitats that depend on HNVF management is between €130 and €1100 million per year until 2020, if it is assumed that 15 per cent of the degraded habitats are restored, rising to three times this figure if all degraded habitats are restored by 2020. These costs are based on the use of voluntary agri-environment and non-productive investment support, which generally do not achieve 100 per cent uptake, even in well-designed schemes with reasonably attractive payment rates. Nor can these payment calculations take into account the fixed costs of keeping in place the HNVF farming system that underpins habitat management and provides the grazing livestock, skilled labour, buildings and equipment needed.

The second approach taken by this study uses current CAP support as the starting point and seeks to estimate future funding needs from the farmers' perspective. Detailed case study examples from Romania, Spain and the UK show clearly that to secure the economic survival of the HNVF farming systems and conservation management of their HNV land additional spending will be required above current levels of CAP support received by wholly HNVF farms. This could be achieved in different ways, including provision of additional funding and/or reallocation of existing CAP expenditure.

The additional funding needs of the three 'whole farm' HNV livestock systems examined in this study illustrate some of the problems and possible solutions. In Scotland, where semi-natural grazing areas dominate agricultural land use, a significant increase is needed in CAP support to these areas, together with better linkage of support to the HNV livestock farming systems. In Aragón (Spain) a five-fold increase in regional expenditure on agri-environment and LFA support would be needed just to extend these payments to all Natura 2000 HNV farmland. To put the scale of this increase in context, 'regionalised' implementation of the current 'historic' SPS expenditure envelope in Aragón would achieve a similar scale of farm level payments to all HNVF without changing the total CAP expenditure in the region, although there would be other implications. In Romania, many HNVF farmers already benefit from a carefully balanced package of SAPS, agri-environment and LFA payments, but

additional funding would be needed to extend coverage of these payments to all HNVF grasslands.

Substantial increases in funding are required in other Member States with whole farm HNVF systems, for example in Bulgaria to extend basic CAP support to HNVF farmers now excluded, in Latvia and Croatia to bring recently abandoned semi-natural habitats back into HNVF farming. The Romanian experience has shown that locally appropriate and balanced combinations of CAP support measures from both Pillars can help to retain HNV farming systems. Similar approaches might be relevant elsewhere, including in Member States that must restructure their historic SPS payments to a regional BPS model for 2015.

The sizeable increases in the scale of CAP funding required should be seen in the light of the very low payments per hectare that many HNV farmers now receive compared to more intensive (and often economically viable) farming systems in Member States that apply the historic SPS model. The situation in Member States implementing SAPS is far more balanced.

The most effective way of supporting HNVF in future will vary considerably from one region or Member State to another, depending on the economic performance of the HNVF system, the way in which the current combination of CAP payments/requirements currently 'add up' for a particular HNVF farming system and, crucially, the extent to which the Member State chooses to prioritise environmental public goods and HNV systems in their implementation of both Pillars of the CAP.

12.3 The CAP from 2015

12.3.1 The revised CAP offers Member States new opportunities to radically improve safeguards and support for their HNV farmland in 2014-20

There are new and improved opportunities for delivering integrated and targeted packages of support for HNV farming systems and land using **both** Pillars of the CAP in 2014-20. The primary aim of support should be to make continuation of HNVF farming systems of high biodiversity value an economically rational choice for existing HNVF farmers and their successors, rather than the alternatives of abandonment, afforestation or intensification. The reformed CAP offers welcome new opportunities to take a positive and imaginative approach to support HNV farming, but this will not happen by default. A number of these are debated below.

However it must be recognised from policy discussions in the last two years that there is a significant risk that Member States will not use these opportunities on the significant scale required to improve CAP support for HNV farming. Many of the key decisions are optional for Member States under the new legislation, and in the case of Pillar 1 implementation do not require Commission approval. With a limited CAP budget, additional support for HNVF farmers usually would imply that Member States would have to prioritise HNVF needs against competing demands from other sectors of agriculture. This will be politically difficult in many parts of the EU with large areas of HNVF, particularly where significant areas of HNVF have not been eligible for CAP support, where historic SPS payments for HNV farmers are disproportionally low compared to other farmers, or where HNVF farming systems are

seen as a social problem and an inefficient form of farming, rather than a vital biodiversity resource with benefits for rural employment. There is a lack of awareness of the societal value of HNVF and the risks to its survival, both within the agricultural sector and among the rural population in many parts of Europe, which has consequential effects on policy choice and implementation.

The future of HNVF in EU-28 depends to a considerable extent on the choices made by Member States in 2014 and beyond (with or without Commission approval). Key issues include allocating CAP funding, setting relative priorities for and limits to the 'reach' of different policy tools and streams of funding – and, in making these choices, the extent to which they do or do not prioritise *jointly* the biodiversity value and economic needs of the remaining or recently abandoned HNV farming systems. This is a crucial period for translating EU biodiversity objectives into practical support measures for HNV farmland. The key implementation decisions regarding HNVF apply to both Pillars of the CAP and also to data needs and institutional and technical capacity. These are outlined below.

12.3.2 Pillar 1 implementation decisions by Member States

Evidence from this report suggests that the most important CAP related decisions for HNV farming to be made by Member States in 2014-15 concern: the land, agricultural activities and farmers eligible for direct payments; the payment rates set for BPS in Member States making the transition from historic-based SPS; the minimum activity requirements for BPS and the requirements and safeguards for HNVF land affected by the new Greening Payments; and the use of optional direct payment schemes. The key issues are:

Defining the HNVF land and features eligible for direct payments

There are variations in eligibility rules among Member States; those wishing to ensure that the greatest area of HNVF is eligible for CAP Pillar 1 payments have the option of:

- defining 'permanent grassland' to include all Annex 1 habitats dependent on agricultural activity and other types of HNV pastures on the basis that these are either: herbaceous pastures where up to 49% of the parcel is covered shrubs and trees that can be grazed; or land that is grazed as part of established local practices but where grasses and other herbaceous forage are not traditionally predominant;
- recognising characteristic trees and landscape features of HNVF as part of the eligible area, on the basis that these are: traditionally part of good practice, or included in the landscape requirements of GAEC 7 for protection of landscape features, or are scattered trees that can be grazed or yield fruit; or, in the case of other trees, there are not more than 100 trees per hectare; or applying a system of pro-rata calculation of eligibility that takes account of ineligible elements such as roads and buildings but does not penalise actively farmed grazing land;
- including very small HNVF farms, by using the lowest possible threshold for eligible land per holding (which is below one hectare in many Member States).

The way in which minimum 'agricultural activity' is defined for the purposes of direct payment eligibility is crucial for HNVF, especially when grazing management is critical for maintaining HNV biodiversity

Definitions that risk permanent damage to the biodiversity value of HNV semi-natural grasslands and other habitats that depend on grazing need to be avoided if possible,

particularly the complete loss of grazing on HNVF pastureland. This requires some form of reference to grazing in the rules defining 'minimum activity' in such cases. Since 2005 several Member States have defined minimum activity in such a way that it is limited to occasional mechanical clearance of vegetation with no requirement for grazing. This has had the consequence of HNVF land continuing to receive Pillar 1 payments even after the beneficial HNVF system has been replaced by occasional mechanical clearance. As well as a major loss of environmental value, limiting activity to occasional mechanical clearance can be an incentive for HNVF farmers to abandon livestock rearing and seek off-farm employment, with the consequent loss of both agricultural jobs and vital skills. To avoid deterioration of the biodiversity value of HNVF semi-natural habitats:

- Member State authorities would need to distinguish HNV semi-natural habitats as a distinct type of agricultural area to be maintained by grazing and/or mowing and removal of the cut vegetation as appropriate, but not to be maintained solely by mechanical clearance of vegetation without removal of the cut material.

In Member States using SPS farmers often farm more hectares of land eligible for CAP payment than the number of hectares required to match the payment entitlements that they own. This means that the total area of farmed HNVF land is under-estimated in IACS despite the fact that it is recorded as eligible in LPIS. The transition to BPS provides an opportunity for Member States to allocate BPS entitlements in a way that ensures:

- farmers claiming direct payments have to declare all the eligible agricultural land that they use including common grazings and areas naturally kept in a state suitable for grazing or cultivation.

In Member States making the transition from historic-based SPS to BPS (and from LFA to ANC):

- ensure that the payment 'regions' and rates are defined in such a way as to provide sufficient support for HNVF farms with below average stocking densities and do not disadvantage them compared to more productive farmland, as is usually the case at present.

Design Greening Payments in a way that protects HNVF land from damaging change of use; and safeguards characteristic HNVF landscape features and farming practices by:

- defining the rules for crop diversification requirements so that landscape features within the cropped area, fallow land and mixed cropping can count towards the requirements;
- applying the requirement for retention of permanent grassland at holding level for all semi-natural permanent grasslands (including non-herbaceous pastures);
- using the option to designate 'environmentally sensitive permanent grassland' outside Natura 2000 areas to reinforce the protection of Annex 1 habitats and to protect other semi-natural permanent grassland (including non-herbaceous pastures, peatland and wetland) from afforestation and conversion to short rotation coppice;
- where there are large contiguous areas of HNVF or Natura 2000 arable and mixed farming, implement ecological focus area in a way that safeguards HNVF biodiversity, if appropriate by adopting a regional implementation approach;
- defining the rules on land eligible as ecological focus areas so that:

    - HNV fallow, terraces, landscape features, semi-natural habitats and trees fall within the definition of ecological focus areas;
    - the rules for ecological focus areas do not create an incentive for afforestation of HNVF, particularly of semi-natural permanent grasslands (including non-herbaceous pastures); this is a priority on species-rich grasslands not already protected by designation;
- ensuring that farmers with a significant arable area have a positive incentive to designate remaining HNVF areas within the holding as ecological focus areas.

Make full use of appropriate optional direct payment schemes to support HNVF farming systems, for example by using:

- the Redistributive Payments measure (which provides additional payments for a certain number of hectares in a BPS claim) specifically for the benefit of HNVF farming systems which typically have smaller average holding sizes and/or lower payment rates per hectare than the national average;
- the Small Farmers Scheme to support the smallest HNVF holdings;
- where required, using voluntary coupled support specifically targeted at the most biologically important and economically vulnerable HNVF farming systems (for example extensive beef and sheep systems using semi-natural pastures, traditional olive production); coupled livestock payments should have locally appropriate minimum and maximum stocking rates per hectare that reflect the carrying capacity of semi-natural habitats.

12.3.3 Pillar 2 implementation decisions by Member States

EU priorities for the use of EAFRD funds in 2014-20 include *inter alia* 'restoring, and preserving and enhancing biodiversity, including in Natura 2000 areas, areas facing natural or other specific constraints and high nature value farming'. Member States are required to reserve at least 30 per cent of the EAFRD contribution to be used on agri-environment-climate, organic, ANC, Natura 2000 and forest-environment payments and on investments related to forests, environment and climate.

Member States have the freedom to use these and other EAFRD measures and delivery mechanisms (such as thematic sub-programmes and LEADER) in a ways that meet this EU biodiversity priority and are closely focused on the specific needs of HNVF farming systems and HNV rural communities. Options include:

As the first priority, to provide all farmers of HNV land with access to environmental land management and restoration schemes that support both the locally characteristic HNV farming systems and the on-going HNV management and restoration of specific habitats, by:

- ensuring relevant agri-environment-climate payments are available on all HNVF land, giving priority initially to full coverage of Natura 2000 farmland and to land outside Natura 2000 areas that has Annex I habitats and/or is used by Annex II species and depends to some extent on agricultural activity. For HNVF grazed woodland habitats classified as forest (not as agricultural land) forest-environment payments and/or payments for the use of grazing animals to protect against fire damage are an alternative option for Member States;

- using the non-productive investment measure to restore HNVF habitats and landscape features that have been recently abandoned;
- exploring collective approaches to agri-environment-climate payments where individual farms face high transaction costs;
- encouraging uptake of agri-environment-climate payments by using the option to include 30 per cent transaction costs for group applications in HNVF areas with large numbers of small farms.

In conjunction with agri-environment-climate payments, support HNV habitat and species management by:

- using the extended compensation measure within Natura 2000 areas and also elsewhere to link together HNV farmland habitats where legal restrictions are in place at farm level for habitats and species management;
- providing support for drawing up Natura 2000 and other HNVF management plans by using the measure for basic services and village renewal
- ensuring that environmental safeguards for both EAFRD and nationally funded afforestation schemes protect HNVF pastures (especially Annex I and II habitats) from damage by afforestation[95].

In Member States where the LFA (and successor ANC) payments are used:

- ensure that these payments are linked clearly to basic land management practices characteristic of local HNVF farming, if necessary in a separate LFA/ANC sub-scheme

Use EAFRD measures for investment, advice, knowledge transfer, co-operation and innovation in a way that will:

- safeguard and enhance the capacity of HNV farms to sustain their characteristic HNV farming systems and add value to their HNVF agricultural and biodiversity products.

12.4 Designing a coherent and effective HNVF support package from both CAP Pillars

The challenge for Member States and regions is to provide CAP support from both Pillars to HNV farming systems on a much larger scale than before; and to design effective CAP payment packages which achieve the right balance at *farm level*, between decoupled support and payments linked to HNVF specific farming activity, to provide an incentive for farm families to continue HNV farming in the long-term on a full-time or part-time basis.

12.5 Improving data and institutional and technical capacity to address HNVF policy needs

Improved data on HNVF is required for cost-effective and efficient targeting, delivery, monitoring and evaluation of HNVF support. More detailed, comprehensive and regularly updated information is required particularly on the agricultural and socio-economic characteristics of different HNV farming systems, with data on land cover, intensity and timing of farm management, and density and structure of landscape and habitat features.

[95] Member States are required to apply environmental requirements to EAFRD supported planting schemes so that *'the selection of species to be planted, of areas and methods to be used shall the inappropriate afforestation of sensitive habitats such as peatlands and wetlands and negative effects on areas of high ecological value including areas under HNV farming….'* EU Regulation 1305/2013 Article 22 and Delegated Regulation (of 11 March 2014 C(2014) 1459, Article 6).

For HNVF monitoring purposes sample surveys can be used, as in Germany, but targeting support requires extending the scope of CAP data already gathered at farm and parcel level. For example Austria has already moved in this direction, with IACS record that show intensity of meadow management (the number of cuts per year).

HNVF data at EU and Member State level could be improved cost-effectively by developing existing agricultural data systems and linking these to biodiversity and land cover data where appropriate. HNVF data requirements could be added to existing datasets, particularly LPIS/IACS and FSS, and to well-established farm sample surveys such as the FSS farming practice survey and LUCAS. Developing EU wide datasets in this way would still allow national or regional agricultural and environmental authorities to refine this information by adding locally specific HNV data sets.

Extending effective CAP support measures to all HNVF land will place new demands on managing authorities, paying agencies and organisations that support CAP delivery from the agricultural and environmental sectors. This applies particularly to technical expertise needed to understand the complexities of the functional relationship between HNVF farming systems, management practices and biodiversity. The Commission has an important role to play in providing managing authorities and paying agencies with clear guidance on the use of CAP funds (especially Pillar 1) to protect and support HNVF. Member States have the opportunity to use EAFRD funding for technical assistance and advisory services to enhance delivery capacity.

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