IRENA Indicator Fact Sheet

IRENA 26 – High nature value (farmland) areas

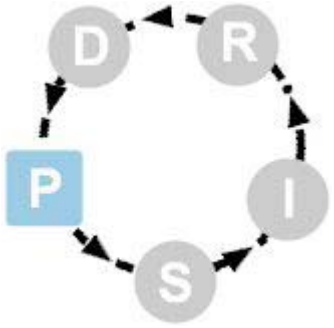
Indicator Definition

This indicator shows the share of the Utilised Agricultural Area that is estimated to be High Nature Value farmland.

Indicator links

Input Indicator Links:
IRENA 08 - Fertiliser consumption
IRENA 09 - Consumption of pesticides
IRENA 13 - Cropping/livestock patterns
IRENA 14 - Management practices
IRENA 15 - Intensification/extensification
IRENA 32 - Landscape State

Output Indicator Links:
IRENA 33 - Impact on habitats and biodiversity
IRENA 35 - Impact on Landscape Diversity



Key messages

1) High Nature Value (HNV) Farmland comprises the hot spots of biological diversity in rural areas. They are often characterised by extensive farming practices, associated with a high species and habitat diversity or the presence of species of European conservation concern.
2) High nature value farmland is estimated to make up 15-25% of the utilised agricultural area in EU-15.
3) The majority of HNV farmland is located in southern Europe (parts of Spain, Portugal, Greece) and in northern Europe (uplands of UK and Ireland).
4) HNV farming systems are generally threatened by trends of intensification and abandonment of agricultural management. These can occur in different areas but also alongside each other.
5) Generally, methodological improvements as well as further data collection are still required to obtain more detailed insight into the extent and distribution of HNV farmland in the EU-15. For example, due to data problems no separate maps can be produced of the different types of HNV farmland (types 1-3, see 'Introduction').
6) The current targeting of CAP policy instruments, such as agri-environment schemes does not appear to be sufficiently focused on HNV farmland in a comparison of the EU-15 Member States.

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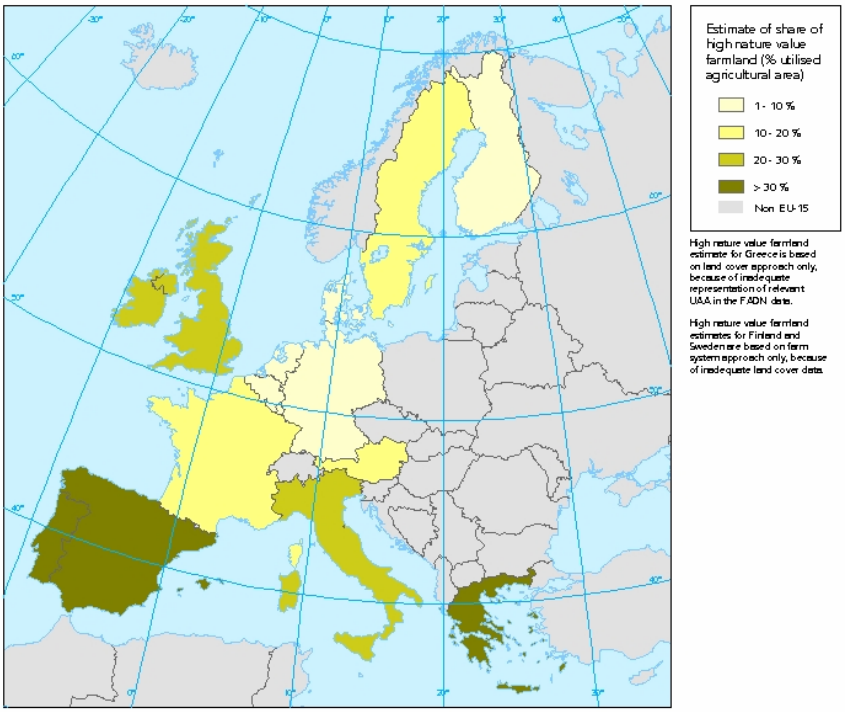
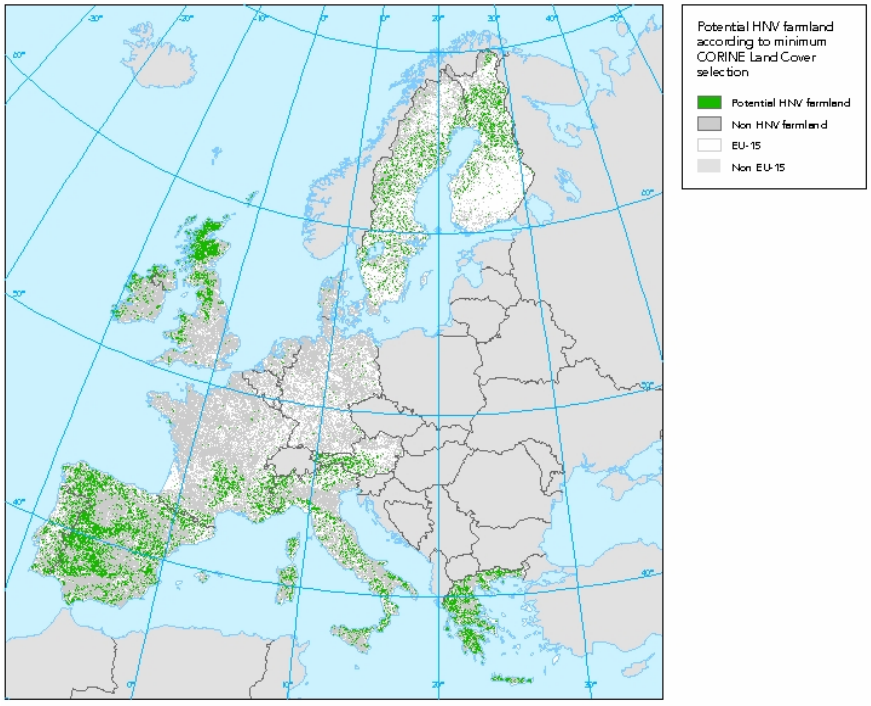
Figure 26.1. Estimated share of HNV farmland according to combined minimum CORINE Land Cover selection and FADN based minimum estimate.



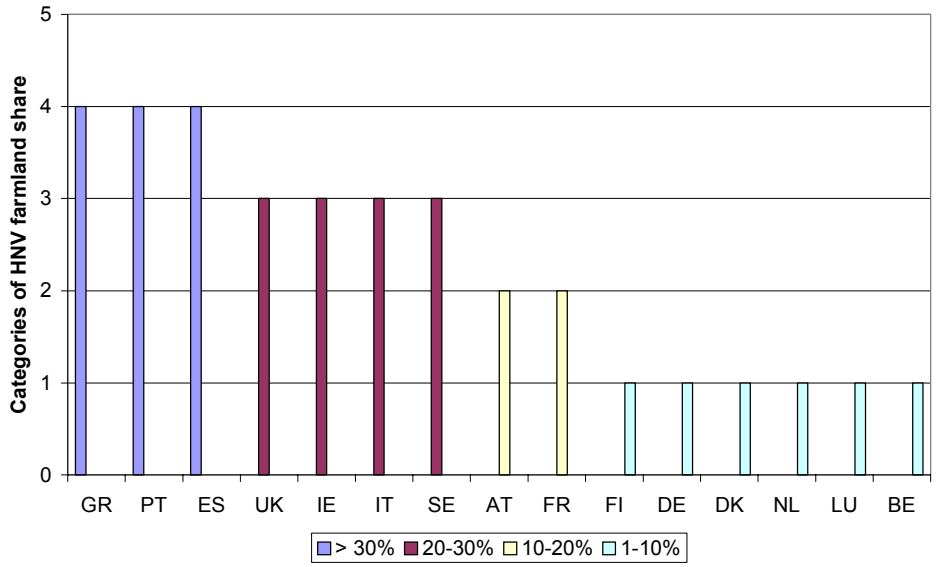
Source: Andersen *et al.*, 2003

Figure 26.2. Potential HNV farmland according to minimum CORINE Land Cover selection.



Source: Andersen et al., 2003

Figure 26.3. Share of HNV farmland of total Utilised Agricultural Area



Source: EEA, 2004
Note: Share estimated on the basis of the combined minimum CORINE Land Cover selection and FADN based minimum estimate. Data inaccuracies only allow a presentation in four categories. Table 26.1 provides further detail on the FADN and CORINE minimum estimates.

Results and assessment

Introduction

Europe possesses unique rural landscapes that represent a rich cultural and natural heritage. Regionally differing farming practices have led to a variety of agricultural habitats that host a large number of plant and animal species. The biodiversity of farmland, however, has rapidly declined across Europe in the last few decades, such as the common birds of the countryside (EEA, 2004).

Baldock *et al.* (1993, 1995) described the general characteristics of low-input farming systems in terms of biodiversity and management practices and introduced the term high nature value farmland. Most of these farming systems are characterised by low stocking densities, low use of chemical inputs and often labour intensive practices, such as shepherding.

The HNV farmland indicator cf. Andersen *et al.* (2003) distinguishes the following types of high nature value farmland:

Type 1: Farmland with a high proportion of semi-natural vegetation.

Type 2: Farmland dominated by low intensity agriculture or a mosaic of semi-natural and cultivated land and small-scale features.

Type 3: Farmland supporting rare species or a high proportion of European or World populations.

Type 1 and Type 2 areas are identified on the basis of land cover data (CORINE database) and agronomic farm-level data (in particular the Farm Accounting Data Network). Combined, these two approaches give information on distribution and farming characteristics. Type 3 areas can only be identified on the basis of species distribution data. Due to data limitations this is currently possible for breeding birds only. Thus the species approach is limited by the availability of data and is not included in this analysis.

Figures 26.1 and 26.3 show the combined results of the land cover and farm system data approach. It is not possible at this stage to produce separate maps for the different HNV farmland

types described above. The results of the CORINE land cover exercise are presented in Figure 26.2, as they provide further detail on the likely spatial distribution of HNV farmland.

Policy relevance and context

The need for measures to prevent the loss of high nature value farmland is widely acknowledged. Its conservation is an explicit objective in the framework of EU rural development policy. Article 22 of the EU regulation on rural development (1257/99) states that support shall be given to 'the conservation of high nature value farmed environments which are under threat'. Unfortunately, the knowledge of what constitutes high nature value farmland has been quite limited so far. A lack of distribution and monitoring data has prevented insight into the targeting and effectiveness of policy measures. In May 2003, this was recognised by the European ministers of environment in Kyiv. In their final resolution (UN/ECE 2003), they declared the following:

“By 2006, the identification, using agreed common criteria, of all high nature value areas in agricultural ecosystems in the pan European region will be complete. By 2008, a substantial proportion of these areas will be under biodiversity-sensitive management by using appropriate mechanisms such as rural development instruments, agri-environmental programmes and organic agriculture, to inter alia support their economic and ecological viability. By 2008, financial subsidy and incentive schemes for agriculture in the pan European region will take the conservation and sustainable use of biodiversity in consideration” (EEA/UNEP, 2004).

At the stakeholders’ conference on “Biodiversity and the EU – Sustaining Life, Sustaining Livelihoods”, jointly organised by the Irish Presidency and the European Commission in Malahide (May 2004) the “Message from Malahide” was adopted. The Message identified 18 objectives and related targets which could form the basis for future priority action in reaching the 2010 EU target of halting the loss of biodiversity (the Gothenburg objective) as well as contributing to the global target of significantly reducing the current rate of loss of biodiversity by 2010. With regard to high nature value farming areas, an identified target was that: ‘High Nature Value areas (including the Natura 2000 network) threatened with loss of biodiversity and abandonment should be identified, and measures to address those threats be provided’ (Objective 5.2) (Conference, 2004).

The main policy instruments for site protection at EU level are the birds and habitats Directives (79/409/EEC, 92/43/EEC). Annex I of the habitats Directive lists natural and semi-natural habitat types that must be maintained in a favourable conservation status by the Member States. The Natura 2000 network will build on the proposed sites of communal interest (pSCIs 5) that have been listed by the Member States. Out of the 198 habitat types listed in Annex I of the habitats directive, 33 require extensive agricultural management and can be regarded as high nature value farmland.

At the EU level the common agricultural policy (CAP) is the most relevant policy with regard to conservation of high nature value farmland, in particular outside protected areas. Conservation of high nature value farmland areas relies to a large extent on measures under the so-called 'second pillar' of the CAP, notably support to less favoured areas and agri-environment schemes. Farmers in less favoured areas are eligible for payments per hectare in addition to conventional CAP support. These payments will generally increase profitability of farming in marginal areas under natural constraints. As such they are potentially an effective tool for preventing abandonment of high nature value farmland, provided that they do not create incentives for intensification and particularly overgrazing.

Some concerns have been expressed as regards the effect of decoupling of CAP income support from production on future abandonment of farming in HNV areas (Eden, 2004 and Poux, 2004). The impact of such trends on habitat quality of HNV farmland will depend to some degree on the implementation by Member States of relevant cross-compliance conditions under Annex 4 of Regulation 1783/2004 (Good agricultural and environmental conditions). Also, the degree of abandonment will depend on the performance of markets and the mitigating effect, which other measures (i.e. compensatory allowances for LFA) could have. Decreasing market returns may

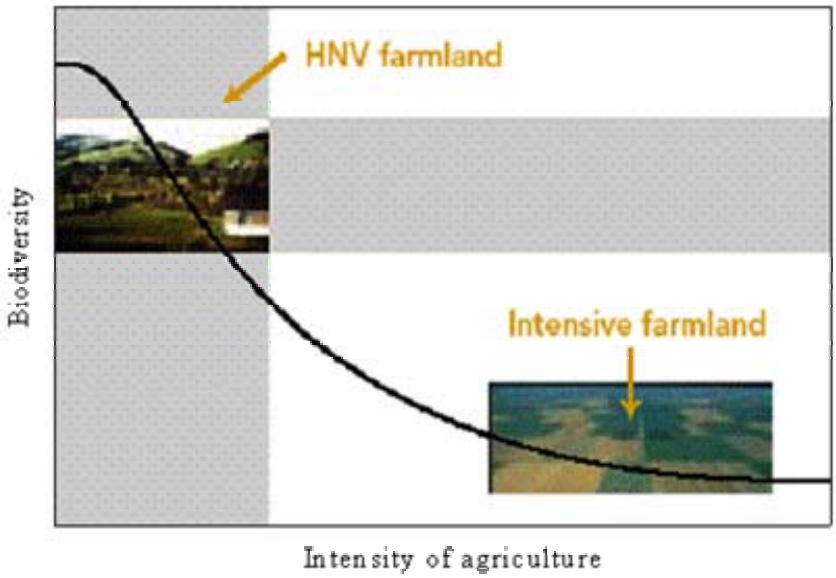
result not only in negative social and economic consequences threatening rural development, but also associated impacts on landscape and biodiversity. Although not all land abandonment can be considered as threatening from a biodiversity perspective, the less viable farms tend to be concentrated in the high nature value farmland areas (European Commission, 2004).

Agri-environmental context

Biodiversity generally decreases when the intensity of farming increases (in terms of nutrient and pesticide inputs, use of machinery and overall productivity). The most intensive arable and grassland systems are very species poor. Despite their low intrinsic biodiversity, however, they may still provide wintering grounds for migratory waterfowl (EEA, 2004)

The highest biodiversity generally coincides with low agricultural inputs. Although extensive mixed arable systems may also support high biodiversity, the majority of high nature value farmland consists of semi-natural grasslands. They are the true hot spots for biodiversity. In the Dutch province of Friesland, for example, only 1.5 % of the land area is unfertilised semi-natural grassland, yet 60 % of terrestrial plants are more or less confined to this habitat (Schotsman, 1988).

Figure 26.4 General relationship between agricultural intensity and biodiversity



Source: After Hoogeveen *et al*., 2001

The extensive character of most high nature value farming systems can be explained by natural conditions, which prevent the use of modern techniques and machinery, general socio-economic constraints, or a combination of both. High nature value farmland is threatened by two contrasting agricultural trends: intensification and abandonment (EEA, 2004). The transformation of high nature value farmland to other uses, mainly forestry, has also been identified as a threat for biodiversity.

Intensification takes place in order to increase yields and overall efficiency, where natural and economic conditions allow it. This has been a continuous process in most parts of western Europe for decades, reflected in an increase in fertiliser inputs and milk and cereal yields. The ma of low-input arable systems may be intensified in the foreseeable future. However, increasing

labour costs and difficult working conditions in extensive livestock systems are likely to induce future intensification or simplification of management.

With regard to land abandonment, this is generally caused by unfavourable socio-economic conditions in rural areas with extensive agriculture. In these areas, depopulation is occurring, which affect the countryside and the environment profoundly. Low incomes, hard working conditions and a lack of social services in many areas make farming a less attractive option for young people. The proportion of the elderly is already very high amongst farmers. As a result, land abandonment is to be expected (Heilig, 2002). These issues affect most current HNV farmland systems, but again appear to be a particular threat for those depending on livestock production.

In terms of nature impacts, loss of semi-natural vegetations is a consequence of the above agricultural trends. Although many case studies exist (see for example Veen and Seffer, 1999), no reliable pan-European trend data are currently available for plant communities and habitats. The best data available are for birds. Farmland birds are indicative of overall biodiversity, since they depend on a variety of plant and animal food and diverse vegetation structures for feeding, nesting and shelter against predators (see for example Potts, 1986). Tucker and Heath (1994) estimate that more than 40 % of all declining bird species in Europe are affected by agricultural intensification, whereas more than 20 % are affected by abandonment.

Assessment

The results show that high nature value farmland is most prevalent in Greece, Portugal, Spain and northern UK. In lowland western Europe, agriculture has become very intensive and high nature value systems are consequently rare.

Figures 26.1 and 26.3 show potential HNV farmland according to the combined minimum CORINE Land Cover selection and FADN based minimum estimate. Although useful for a general impression of the potential distribution of high nature value farmland, the map is only indicative. There is a need for future revisions on the basis of updated and more detailed data, and for refinements on the basis of national datasets.

Due to the limitations of the CORINE land cover data, Type 2 high nature value farmland tends to be underrepresented in the minimum estimate (for example bocage landscapes in France). Type 3 farmland is also only partially included. Intensively used grassland may be important as wintering grounds for waterfowl but these areas, mainly concentrated in lowland western Europe, do not show up on the map in Figure 26.3.

An additional difficulty is that land cover data do not indicate local pressures such as overgrazing. The indicated distribution of high nature value farmland in the uplands of the UK, for example, may be optimistic because overgrazing is reported from a number of locations. For Finland and Sweden, the distribution pattern of potential high nature value farmland is also optimistic due to interpretation problems of actual agricultural use. National data sources for Finland indicate a concentration in the southern part of the country.

High nature value farmland areas are generally under severe pressure due to a vulnerable economy of the farming systems concerned. Predominant agricultural trends are intensification, on the one hand, and land abandonment, on the other. Both are considered detrimental to biodiversity conservation. Little information exists on the exact conservation status of high nature value farmland areas, but the overall population trends of characteristic species, such as the great bustard (Otis tarda), black grouse (Tetrao tetrix) and corncrake (Crex crex) are negative.

Policy responses in the EU include site protection under the habitats and bird directives and environment measures under the common agricultural policy. The Natura 2000 sites, as proposed by the Member States, cover less than one third of high nature value farmland area (EEA, 2004). Their conservation status is again largely unknown. A monitoring system is under development but not yet operational.

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Conservation of high nature value farmland areas relies as noted above to a large extent on measures under the 'second pillar' of the common agricultural policy, notably support to less favoured areas and agri-environment schemes. Less favoured areas overlap largely with the high nature value farmland areas, but there is no relation between actual expenditure in the different Member States and their share of high nature value farmland. Agri-environment schemes do not appear to be sufficiently targeted at high nature value farmland either. In countries with a high share of nature value farmland, especially in southern Europe, agri-environment expenditure is relatively low (see IRENA no 1).

Decoupling farm income of support payments provides another mechanism for supporting extensive cereal systems, for example, as long a continued land management is ensured. The cross compliance conditions introduced with the CAP reform in 2003 have put in place certain safeguard conditions that support a continued management of marginal high nature value farmland areas. However, the combined effect and CAP reform on high nature value farmland areas needs to be carefully monitored in the future.

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Data

Table 26.1. Estimated share of HNV farmland

Country	UAA (million ha.)	Estimate of share of HNV (% UAA)		
		CORINE based	FADN based	Mean
Greece[1]	3.6	53	9	53[1]
Portugal	3.9	38	35	37
Spain	26.2	41	27	34
UK	15.8	30	23	27
Ireland	4.4	25	23	24
Italy	13.1	30	12	21
Sweden[2]	3.1	34	20	20[2]
Austria	3.4	29	9	19
France	27.9	27	3	15
Finland[2]	2.2	49	5	5[2]
Germany	17.2	2	5	3
Denmark	2.6	5	1	3
The Netherlands	2.0	3	0	2
Luxemburg	0.1	0	2	1
Belgium	1.4	2	1	1
Total EU-15	127		15-25%	

[1] HNV estimate based on land cover approach only, because of inadequate representation of relevant UAA in the FADN-data.
[2] HNV estimate based on farm system approach only, because of inadequate land cover data.

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Meta data

Technical information

1. CORINE database: CORINE contains information on the distribution of a total of 44 Land Cover Classes (LCCs) and nineteen of these were selected on the basis of being potentially closely associated with agricultural land (Table 26.2).

Table 26.2: The 19 Corine Land Cover Classes (LCCs) which were regarded as being potentially associated with agricultural land

CORINE code	CORINE LCC
2.1.1	non-irrigated arable land
2.1.2	permanently irrigated land
2.1.3	rice fields
2.2.1	vineyards
2.2.2	fruit trees and berry plantation
2.2.3	olive groves
2.3.1	pastures
2.4.1	annual crops associated with permanent crops
2.4.2	complex cultivation patterns
2.4.3	land principally occupied by agriculture with significant natural vegetation
2.4.4	agro-forestry areas
3.2.1	natural grasslands
3.2.2	moors and heath lands
3.2.3	sclerophyllous vegetation
3.2.4	transitional woodland-scrub
3.3.3	sparsely vegetated areas
4.1.1	inland marshes
4.1.2	peat bogs
4.2.1	salt marshes

Prior to attempting to select which of these LCCs may be more indicative of HNV farmland, it was decided that this selection process would need to be stratified using a combination of national boundaries and Environmental Zones. This stratification was considered necessary:

- To take into account the fact that there are known inconsistencies in the way CORINE classes have been interpreted between the different European countries
- To reflect the fact that there are differences in the type of HNV farmland that can occur between different countries and also often within different climatic and altitude zones.

Expert judgements (from the Member States) were then used to refine the selection of LCCs.

An example of the selection of CLCs is provided in Annex 1. For further information please see MDFS 26.

2. CLC was elaborated based on the visual interpretation of satellite images (Spot, Landsat TM and MSS). Ancillary data (aerial photographs, topographic or vegetation maps, statistics, local knowledge) is used to refine interpretation and assign classes. The CLC database is based on a standard production methodology characterised by the following elements: Mapping scale is 1:100 000. Mapping accuracy is 100 m. The minimum mapping unit for the inventory is 25 ha for areas, and 100 m for linear elements.
3. FADN: The Farm Accountancy Data Network (FADN) is an instrument for evaluating the income of agricultural holdings and the impacts of the Common Agricultural Policy. The concept of the FADN was launched in 1965, when Council Regulation 79/65 established the legal basis for the organisation of the network. It consists of an annual survey carried out by the Member States of the European Union.

Quality information

4. Strength and weakness (at data level):

Each of delineation approaches has its strengths and weaknesses. The land cover data give the best impression of the spatial distribution of high nature value farmland, whereas the farm type data are considered a more reliable indicator for the total share of high nature value farmland.

Land cover data:

Even though CORINE was the best source of land cover data identified, it is clear that using CORINE Land Cover Classes (LCC) as a means of potentially locating High Nature Value Farmland has its limitations:

Some problems are related to the internal logic of CORINE, which is basically to identify land cover that is relatively uniform. Because the minimal mapping entity was 25 hectares CORINE classes are either determined by the most dominant land use or they have been classified as a mixed class. Especially with the mixed CORINE classes, such as complex cultivation patterns, it is difficult to determine whether HNV farming areas land use are contained in this class, especially because most of the CORINE classes, e.g. “pastures” and “non-irrigated arable land”, do not distinguish between intensive and extensively managed types.

Forest land cover classes had to be excluded from the analysis, as satellite observations data do not allow to distinguish different forest management systems. This means, however, that there was no possibility of identifying the location of various types of grazed forest that may be considered HNV farmland.

Finally, it is essential to remember that land cover information cannot (except in extremis) indicate anything about the quality of the Nature Value relative to its potential since it indicates little about management practices. It should therefore be emphasised that the areas shown in the land-cover derived maps should not be interpreted as meaning that farm management in the mapped areas is necessarily appropriate to maintain HNV farmland quality.

Farm system data:

Given that the aim is to produce a typology of EU-wide application, it is inevitable that there will be errors of inclusion for example of non-HNV systems in HNV classes. These are most likely to occur at or around the class discriminators. Although the FADN database is very extensive, it does have certain limitations for instance with regard to representation, as the FADN (only) represents 52% of the farms and 86% of the Utilised agricultural Area in EU-15.

The strength of the farming system approach is that it provides insight into the farming practices linked to HNV farmland, which means that it can be used to monitor short term changes in HNV farming systems and thus the pressure on HNV farmland. The farming system approach will also provide valuable insight into the policy options for keeping the HNV farming systems in place and for supporting HNV farmland management. The farming system approach also provides (at best) an alternative 'truth' to that given by the land cover approach and comparisons between predicted % cover at the regional scale should prove productive, providing a mechanism for the mutual improvement of the two methods;

5. Reliability, accuracy, robustness, uncertainty (at data level):

Overall scoring (give 1 to 3 points: 1=no major problems, 3=major reservations):

Relevancy: 1

Accuracy: 2

Comparability over time: 2

Comparability over space: 2

Table 26.3: Example of selection of LCCs in the Alpine South Environmental Zone (for all other selections see Annex B) X = selected, O = not selected.

		MIN	MAX	MIN	MAX	MIN	MAX
Alpine South	Class no.	**France**	**France**	**Italy**	**Italy**	**Spain**	**Spain**
Non-irrigated arable land	211	0	X	0	X	0	0
Permanently irrigated land	212	0	0	0	0	0	0
Rice fields	213	0	0	0	X	0	0
Vineyards	221	0	0	0	0	0	0
Fruit trees and berry plantation	222	0	X	0	X	0	X
Pastures	231	X	X	X	X	X	X
Annual cops associated with permanent crops	241	0	0	0	0	0	0
Complex cultivation patterns	242	0	X	0	X	0	X
Land principally occupied by agriculture	243	0	X	0	X	0	X
Agro-forestry areas	244	0	X	X	X	X	X
Broad-leaved forest	311	0	0	0	0	0	0
Coniferous forest	312	0	0	0	0	0	0
Mixed forest	313	0	0	0	0	0	0
Natural grasslands	321	X	X	X	X	X	X
Moors and heath lands	322	X	X	X	X	X	X
Sclerophyllous vegetation	323	0	0	0	0	0	0
Transitional woodland-scrub	324	0	X	X	X	X	X
Bare rocks	332	0	0	0	0	0	0
Sparsely vegetated areas	333	0	X	0	X	0	X
Burnt areas	334	0	0	0	0	0	0
Inland marshes	411	0	X	0	X	X	X
Peat bogs	412	0	X	0	X	X	X