Updated High Nature Value Farmland in Europe

An estimate of the distribution patterns on the basis of CORINE Land Cover 2006 and biodiversity data

European Environment Agency

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1 OBJECTIVE

This is the final report on the update of the High Nature Value farmland indicator based on CORINE Land Cover 2006 (HNV 2006). It describes the data sources that were used to establish the update of the HNV farmland indicator. The applied methodology is the same as the JRC/EEA methodology of the HNV assessment based on CLC 2000 (Paracchini et al. 2008), the main reference is also the 2008 report.

Adaptations of the methodology were applied only when necessary from a technical (data driven) point of view.

2 INTRODUCTION

Some types of farmland are, because of their broad characteristics, inherently high in biodiversity. Baldock et al. (1993) and Beaufoy et al. (1994) described the general characteristics of low-input farming systems in terms of biodiversity and management practices and introduced the term high nature value farmland. The conservation of biodiversity on these farmlands depends on the continuation of low intensity farming practices. The concept of HNV farmland ties together the biodiversity to the continuation of farming on certain types of land and the maintenance of specific farming systems. Typical examples include semi-natural grassland systems, traditional olive, vine and fruit production, Dehesa, Montado and other wood pasture systems and extensive farming in bocage landscapes.

The subsistence of HNV farmlands is threatened; one of the main causes is the change of agricultural land use.
Whereas on better farmland farming systems have generally intensified, poorer land has been subject to abandonment or afforestation. Traditional, low-intensity farming systems with high nature value have gradually and steadily disappeared (EEA, 2009a), although at present they survive on a considerable scale as this report illustrates.

On some types of farmland, such as Alpine meadows and Mediterranean wood pastures, extensification and land abandonment cause a decline of agricultural biodiversity, or of biodiversity linked to agricultural habitats, while in other areas, like the peat meadows in north Western Europe, intensification of agriculture has been a major cause for declines in farmland birds.

In the European Strategy for Sustainable Development (2006) member states declared their commitment to halt the decline of the loss of biodiversity by 2010. This target has not been met, indeed the loss of biodiversity continues at an increased rate. This loss remains one of the most pressing environmental concerns in the EU, potentially leading to substantial economic and welfare losses as was stated in the EC Communication 'Options for an EU vision and target for biodiversity beyond 2010 (EC 2010). The headline target for 2020 proposed in this EC Communication was therefore endorsed by the EU leaders: *'Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss'.* In response to this endorsement and the adoption of a global Strategic Plan for biodiversity 2011-2020[1] a Communication from the EC was published in May of this year 'Our life insurance, our natural capital: an EU biodiversity strategy to 2020' (EC 2011). One of the 6 targets formulated in this communication that should enhance the realisation of halting the loss of biodiversity is specifically targeting agriculture: *'By 2020, 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'.*

The acknowledgement of the importance of sustainable agriculture for the preservation of biodiversity is proposed to be addressed through Common Agricultural Policy - CAP by including HNV farmland among the priorities and targets for rural development programmes. This is clear from the latest proposal for a Regulation on support for rural

[1] On 11 February 2011, the Commission submitted a proposal to the Council for a Council decision on the signing, on behalf of the European Union, of the Nagoya Protocol: *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation*.

development by the European Agricultural Fund for Rural Development (EC 2011b). It is specified that agri-environment payments should, amongst others, be targeted to HNV farming systems and restoring and preserving biodiversity should focus on both Natura 2000 areas and HNV farming. The European Commission also proposes to retain HNV farmland as an environmental CMEF indicator (Common Monitoring and Evaluation Framework for the CAP) beyond 2013. Overall it is therefore clear that the encouragement of Member States to implement the concept of HNV farming into their own rural development (including agri-environment) programmes, which was already done in the RDP 2007-2013, will also continue beyond 2013. Identification and characterisation of these HNV farming is therefore a crucial step in this direction.

Environmental monitoring and evaluation of policies and measures are becoming more important. The EC has given priority to the development of environmental indicators as these are necessary to monitor agri-environment programmes, to provide the contextual situation, to identify environmental issues related to European agriculture, to help target programmes and measures and to understand linkages between agricultural practices and the environment. HNV farmland is an important indicator for the issues related to agro-biodiversity. In addition to the CMEF indicator, the EEA has been developing indicators for HNV farmland at the European level.

However, pan-European data on distribution and conservation status of HNV farmland have been largely lacking. In 2003 the first HNV map of Europe was presented by Andersen *et al.* in a report for the European Environment Agency. The map shows the approximate distribution of HNV farmland in Europe. As biodiversity data were not sufficiently available at European level, the study proposed two approaches for identifying HNV farmland EU wide, based on land cover data (the CORINE data base) and farm system data (derived from the Farm Accountancy Data Network - FADN). Land cover data were considered to provide an indication of the broad distribution pattern of HNV farmland, whereas farm system data can give information about the types and characteristics of the farms concerned and their estimated share in the farm population.

The intention of this work by EEA has always been to estimate the presence likelihood of HNV farmland within Europe using existing Europe-wide datasets. However, it is recognised that the available datasets have drawbacks for HNV farmland identification, as explained below.

These two approaches (land cover and farming systems data) were combined to develop an EU agri-environment indicator on HNV farmland under the IRENA operation (EEA, 2005) which uses the three types of HNV farmland as already defined in Andersen et al. (2003):

> 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.

Farmland of the first type usually has high levels of biodiversity and a clear conservation value, like the dehesas/montados of the Iberian Peninsula, the Alpine meadows and the wood pastures of the Baltic. The second type of HNV farmland is not dominated by semi-natural vegetation but can be rich in biodiversity due to the mix of low-intensity cropping and smaller semi-natural features, including landscape elements. The third type is more intensively farmed but nevertheless hosts important populations of species of conservation concern, most often bird species that are able to adapt to more intensively farmed land.

The three types are meant to be not mutually exclusive, and in their identification it is often difficult to completely separate the one from the other. The three types

distinguished have also been adopted in consecutive studies described below and are also the categories of HNV farmland addressed in this report.

CORINE was used as this data base is available consistently across the great majority of European countries but it should be noted this data base has several drawbacks; various factors in the way they are constructed (scale, particular classes assessment, updates dynamic) means that the results can only be approximate.

Over the years the EEA and the JRC continued to enhance and update the map. In 2008 the results of a major update were presented (Paracchini et al., 2008). The basis of the mapping exercise is provided by the CORINE Land Cover (CLC) map for the year 2000 (EEA 2005) and the Environmental Stratification of Europe (Metzger et al. 2005). Depending on the type of HNV farmland (type 1,2 or 3) additional data sources were used: NATURA 2000 network, Important Bird Areas (IBAs), Prime Butterfly Areas (PBAs) and National biodiversity datasets.

In 2007 the first results of the update of the CORINE land cover map of 2006 (CLC2006) were published (EEA 2007). In 2009 the EEA started with updating the HNV farmland map based on CLC 2006, new data on Natura 2000, IBA data, PBA data and including missing countries like Switzerland, Iceland, Norway, Albania, Bosnia and Herzegovina, Croatia, FYR of Macedonia, Kosovo under UNSCR 1244/99, Montenegro, Serbia and Turkey.

2.1 RATIONALE AND OBJECTIVE OF THE UPDATE

The general goal of the present exercise is to enhance the current European map of HNV farmland. The enhanced map aims to gain a better insight into the current distribution and extent of farmland that is of inherent biodiversity value, and to develop a more effective tool for carrying out further analyses on spatial and time trends in the future.

The specific objectives are: 1) including missing countries in the existing HNV map for Europe and 2) to base the map on better quality and updated data.

Improved insights into the extent and tendencies of HNV farmland are needed to respond to current policy challenges in the field of agriculture and the environment.
The pan European map can be used to review the suitability of policy measures (targeting) for supporting HNV farmland and farming systems. If there is additional info, e.g. on farming trends and payments On its own it can help to evaluate targeting of payments (EEA 2009). It can be used to understand better the linkages between agriculture and the environment and to help targeting policy programs on European level and address agri-environmental issues. The intention is to deliver a map that shows the estimated distribution and presence likelihood of HNV farmland across the whole European territory. Down-scaling the map and using it for regional or national analysis will cause inconsistencies and will not yield reliable outcomes. The results of this pan-European exercise will not prejudge the identification of HNV farming made by the Member States at local level in the context of Rural Development Programme monitoring. In some countries, alternative approaches have been developed for this purpose.
The pan-European HNV map is not intended for evaluation of the impact of Rural Development measures at regional or national level, and is not suitable for this purpose. Guidance on how this evaluation should be carried out within the Common Monitoring and Evaluation Framework is described in the Guidance document on the Application of the HNV impact indicator (EENRD 2008). The use of a basket of HNV indicators is recommended, which means monitoring HNV farming using different methods in parallel, including land cover data, biodiversity data, farming systems data and sample surveys to assess trends in the condition of HNV farmland. Ideally, the land cover and biodiversity

elements of the CMEF work at country level should be harmonised with the pan-European map. Other elements can be seen as separate but complementary indicators.

The previous version of the European HNV map (Andersen et al., 2003, Paracchini et al. 2008) was based on CORINE land cover map 2000. As the CORINE land cover map is available for the year 2006, the HNV map is now updated accordingly. As the final full version of the CLC2006 was only delivered in 2010 the work on the update of the HNV map has also been extended for several years. The update of the HNV map also includes the also previously missing countries and will use other newest datasets, e.g. the most recent Natura 2000 data.

As with the study of Paracchini et al. (2008), the new overall mapping effort is based as much as possible on existing Europe-wide datasets (CLC 2006, Natura 2000 sites, IBAs, PBAs, environmental zones). For some countries national specific information was used (specific examples are referred to subsequently).

The resulting map should be used as a best proxy for the distribution of HNV farmland at European level, taking into account different levels of uncertainty across Europe.

3 METHODOLOGY

3.1 INTRODUCTION

The update of HNV farmland in Europe was carried out in the same way as the HNV farmland assessment according to the JRC/EEA methodology described in Paracchini et al. 2008. The main focus of the current exercise is to update the dataset based on the CLC data 2006 and to include those countries that previously have not been part of the European HNV farmland assessment:

- ✓ Switzerland
- ✓ Norway
- ✓ Iceland
- ✓ Turkey
- ✓ Albania
- ✓ Bosnia and Herzegovina
- ✓ Croatia
- ✓ FYR of Macedonia[2]
- ✓ Kosovo under UNSCR 1244/99
- ✓ Montenegro
- ✓ Serbia

The assessment of HNV farmland in Switzerland, Croatia and Serbia was conducted by national experts and the data were integrated into the European HNV data base by ETC SIA. The specific methods used for these countries are described below. As Greece did not participate in the CLC 2006 activity, no HNV 2006 according to the European methodology could be derived. However Greece has conducted a national mapping of HNV farmland (HOS 2008).

According to Paracchini et al. (2008) the basic mapping steps are:

1) selection of relevant CORINE land cover classes in the different environmental zones in Europe per country
2) refinement of the draft land cover map on the basis of additional expert rules (e.g. relating to altitude, soil quality) and country specific information
3) addition of the biodiversity data layers with European coverage
4) addition of national biodiversity data sets
5) Up-scaling to 1*1 km^2 INSPIRE grid

[2] In the FYR of Macedonia HNV farmland was recently calculated under the Avalon foundation, but was not put forward as part of the official NRC consultation mechanism in time.

3.2 DATA SOURCES

CORINE Land Cover 2006

The basis for the update exercise was the CORINE land cover map 2006 (CLC 2006). Version 15 includes Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Kosovo (under UNSCR 1244/99), Latvia, Liechtenstein, Lithuania, Luxembourg, the former Yugoslavian Republic of Macedonia, Malta, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom. Greece is the only European country that has not participated in the CLC 2006 activity.

Digital Elevation Model

For the previous HNV farmland estimation (PARACCHINI et al. 2008) originally the SRTM 90*90m has been used. For the current exercise the EEA & INSPIRE standard DEM with 100*100m was available and as the differences between these two datasets are negligible it was decided to use the EEA 100*100m instead of the 90*90m SRTM.

Environmental Stratification

For the indication of environmental zones version 8 of the Environmental Stratification of Metzger et al. 2005 was used. Version 8 includes also Cyprus and the European coastline has been made consistent with the CLC coastline. The environmental stratification does not cover Iceland. Turkey is only partially covered, therefore a similar stratification of environmental zones has been provided by the Turkish national experts.

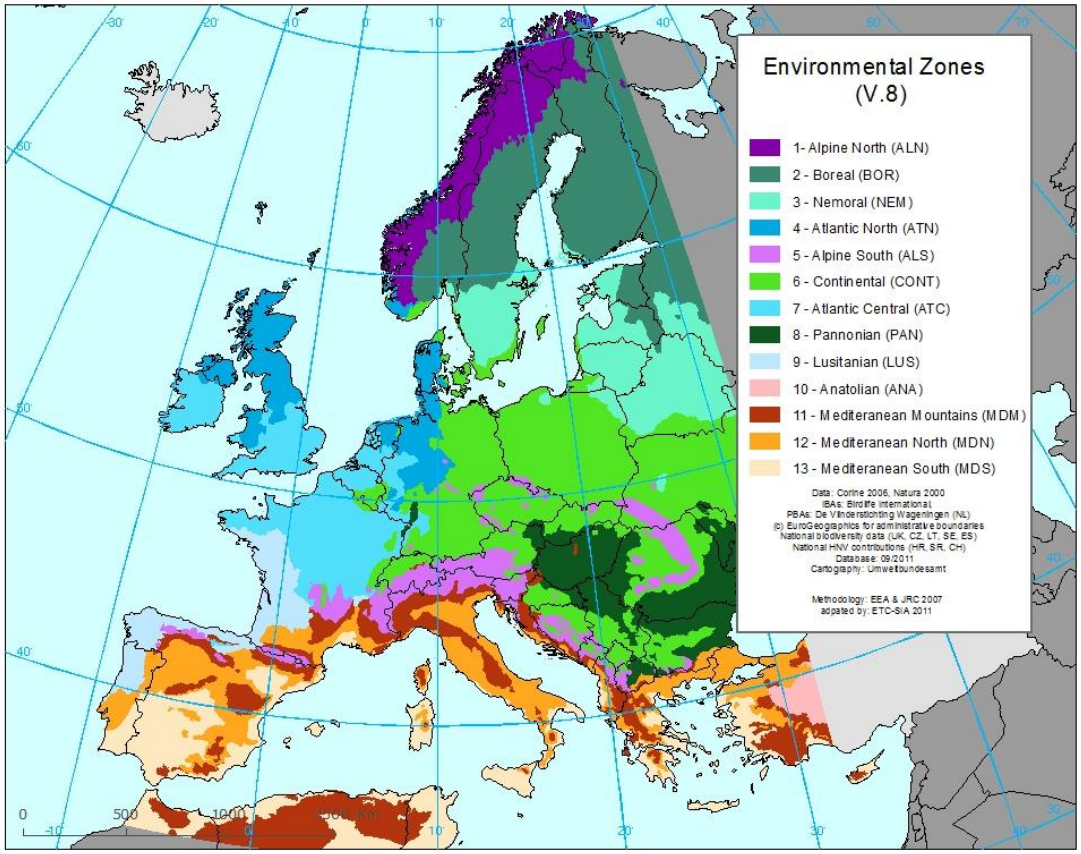

Figure 1: Environmental Zones in Europe (Metzger et al 2005; Version 8)

National expert rules

Additionally national expert rules were used to cover specific national information regarding the CLC classes (see section 3.3)

European biodiversity data

The European biodiversity data used in the HNV mapping exercise consist of geographical areas that have been delineated because of the presence of particular habitats and/or notable populations of species of conservation concern. Complete data sets, such as habitat or species distribution data, were not used as these are not available at the European level, and data are incomplete in most countries. The following sources were used:

NATURA 2000 network or data of the CDDA Database; the updated NATURA 2000 version (December 2010) was used to provide information on protected sites in Europe. Additionally the data of the European Common Database of protected areas were applied in those countries where data of NATURA 2000 and the EMERALD network were not available (Turkey, Norway, Iceland, Albania, Bosnia and Herzegovina, FYR Macedonia). For Croatia the Emerald Network (proposal of NATURA 2000 for Croatia) was used.

Important Bird Areas; provide information on significant populations of one or more globally or regionally threatened endemic or congregatory bird species, or highly representative bird assemblages.

Prime Butterfly Areas, are an initial selection of important butterfly areas in Europe, focusing on target species that are conservation priorities across the European continent, and including both marginal and core populations. This is only an initial selection, coverage is far from complete.

Within each of these biodiversity layers those sites were selected that depend on extensive agricultural practices. For this purpose a list of habitats was established according to the Ostermann (1998) list for selecting Natura 2000 sites, a bird species list was created by experts using feedback from member states to select IBAs and a list of butterfly species was created to select PBAs.

As explained previously, this approach tries to ensure that only farmed biotopes are retained within the HNV layer, but there are situations where this cannot be guaranteed and land may be out of farming use (e.g. marshes, bogs, open woodland). This situation is likely to occur in some regions, thus selection criteria for CLC classes per country and environmental zone were based on the opinion of national experts and has been highlighted specifically as an issue for the HNV farmland map in the cases of Estonia and Finland due to the inclusion of particular CORINE classes of this sort.

For the HNV 2006 calculation a set of new countries was integrated for the first time. The table below lists the availability and information sources of the above mentioned biodiversity layers in these countries. The common database on designated areas (CDDA) was used as a proxy for the identification of protected areas that are of relevance for the estimation of HNV 2006 in countries without Natura 2000 sites. After consultation with experts all CDDA sites that have an importance for extensive agricultural practices were selected (according to the IUCN categories: Ia, Ib, II, IV, V, VI).

Table 1: Availability of European wide biodiversity data

Country	Natura 2000 - proxy data set	IBA	PBA
Norway	CDDA – selection	-	-
Croatia	Proposed SPAs (from EMERALD), with adjusted habitat list (selection made by national team)	No boundaries available – only centre coordinates (SPAs used instead of IBAs)	not used[3]
Turkey	National protected areas	-	-
Iceland	CDDA – selection	-	-

[3] PBA's for Croatia are very indicative and on too large scale so they were not used for HNV farmland analysis in Croatia

Country	Natura 2000 - proxy data set	IBA	PBA
Bosnia and Herzegovina	CDDA – selection	-	-
FYR Macedonia	CDDA – selection	-	-
Montenegro	no digital CDDA-GIS data	-	-
Kosovo (UNSCR 1244/99)	CDDA – selection	-	-
Albania	CDDA – selection	-	-

National biodiversity datasets

These data refer mainly to national inventories of agricultural biotopes or semi-natural grasslands. The countries and data sets concerned are explained subsequently (e.g. in the Czech Republic, Sweden, Estonia, Lithuania and England).

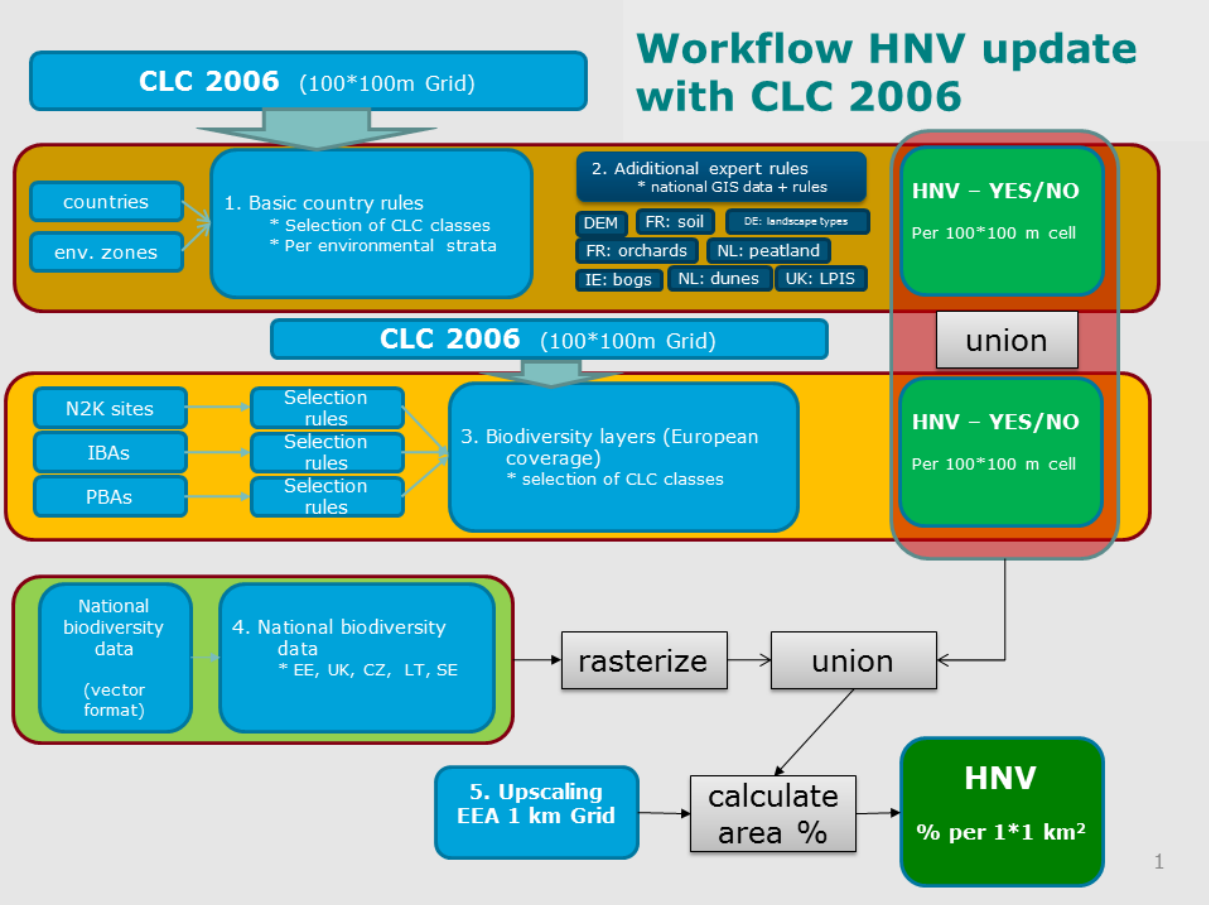

Figure 2: Workflow of the HNV farmland update procedure

Detailed description of the work flow see in annex 6.8

3.3 SELECTION OF LAND COVER CLASSES

For each country and environmental zone CLC classes were identified that were assumed to represent HNV farmland (see annex 6.1). Given the inevitable uncertainties concerning local conditions and farming use, this can be seen as likelihood of HNV farmland presence at EU level (see use of this term in Table 2).

Selection criteria for CLC classes per country and environmental zone were based on the opinion of national experts.

In the JRC/EEA estimation of HNV farmland, country specific selection criteria for CLC-classes were applied (Paracchini et al. 2008). The same approach was applied for the calculation of HNV 2006 for those countries that had not been part of the HNV estimation previously. Criteria were defined by ETC SIA and sent out for country consultation with national experts. The CLC classes of these countries are presented in annex 6.2.

3.4 EXPERT RULES AND COUNTRY-SPECIFIC INFORMATION

According to the HNV farmland estimation by Paracchini et al. 2008 (chapter 2.3.) country specific criteria were applied. These criteria are used to fine-tune the CLC based selection of classes within a country based on mostly topographic constraints (e.g. CLC selected only above 500 m). They are either formulated as additional inclusion of new CLC classes that are not handled in the basic CLC class selection, or as exclusion rules from the basic CLC class selection.

Most of the country specific rules are only applied on the basic CLC selection per country and thus do not affect the selection process of HNV in Natura 2000, IBA or PBA areas. However some rules were also applied within Natura 2000, IBA or PBA areas (e.g. dunes in NL, Danube delta). These rules are specifically marked in the table below.

Table 2: National rules for CLC classes

Country	Exclusion or Inclusion	Rule applied in Natura 2000 areas	Rule	Comment	Dataset
Austria	excl.	x	Dwarf pine (3.2.2) is part of forest area and therefore excluded from selection		
Bulgaria	Not used		identify in a separate file class 243 (land princ occ by agric) when it is below 150 m and on a slope < 3 degrees	DEM slope	<150m < 3°
Cyprus	excl.		Olive groves are mapped above 400 m	DEM	<400
Cyprus	incl.		Arable land (211) potentially HNV in 5 selected areas		
Cyprus	incl.		Permanently irrigated land (212) could be HNV above around 800m	DEM	> 800m
Cyprus	incl.		Vineyards (221) have a good potential above 400 m	DEM	> 400m
Cyprus	incl.		Fruit trees (222) have a good potential only above 600 m	DEM	> 600m
Cyprus	excl.		Olive grows (223) below 400m	DEM	< 400m
Cyprus	excl.		Complex cultivation patterns (242) in coastal areas can be intensive (especially Famagusta administrative district – SE Cyprus)		
Cyprus	excl.		Natural grassland (321) is not grazed above 1.200m	DEM	>1200 m

Country	Exclusion or Inclusion	Rule applied in Natura 2000 areas	Rule	Comment	Dataset
Cyprus	excl.		Sparsely vegetated areas (333) should NOT be selected		
Germany	incl.		no standard rule, but rules based on landscape map	GIS-file	landscape types
Germany	excl.		Grassland (231) in Bavaria is overestimated – exclusion based on national expert judgment	Re-engineering from HNV 2000	
France	excl.		pastures (231) and natural grassland (321) are excluded in Lusitanian zone where ploughing is appropriate or suitable	GIS-file	ploughing
France	excl.		pastures (231) and complex cultivation patterns (242) are added in the Atlantic Central zone only above 400 m	DEM	<400 m
France	incl.		Traditional orchards are added on the basis of auxiliary data (add 231 natural grassland within traditional orchards)	GIS-file	orchards
Ireland	excl.	X	sparsely vegetated (333) areas are mapped above 500 m only[4]	DEM	<500 m
Ireland	excl.	X	raised bogs are excluded (substract raised bogs from 412 Peatbogs)	GIS-file	bogs
Italy	excl.		class 242 is corrected in the Mediterranean Mountains zone, being excluded below 500 m in the following regions: Val d'Aosta, Piemonte, Lombardia, Veneto, Trentino, Alto Adige, Friuli	DEM Region	500 m 7 regions

[4] not integrated in first HNV 2006 calculation

Country	Exclusion or Inclusion	Rule applied in Natura 2000 areas	Rule	Comment	Dataset
Italy	Not used		soils with high organic carbon content (Histosols) behind the Po delta containing non-irrigated arable land (211) should be included : postponed		
Italy	Not used		there might be the need to correct for broadleaved forest and 211 for Mediterranean south (more information needed)		
Netherlands	excl.	X	Class 3.2.1 (natural grasslands) is deleted when occurring on dunes	GIS-file	dunes
Netherlands	incl.		class 2.3.1 (pastures) is added when occurring on peatland	GIS-file	peatland
Romania	excl.	X	In the area of the Danube Delta take everything out except natural grassland	Region	Danube Delta
Romania	excl.		Exclude ALL what is above 1800 m	DEM	1800 m
Slovakia	excl.		CLC selection above 1400 m not mapped	DEM	1400 m
Slovenia	excl.		class 2.4.2 (complex cultivation patterns) is not mapped when height < 350 m and slope < 2%	DEM	350 m
Slovenia	excl.		class 2.4.2 (complex cultivation patterns) is not mapped when height < 350 m and slope < 2%	DEM	slope 2 %
Spain	incl.		class 3.1.1. (broadleaved forest) is added in NATURA 2000,IBA and PBA sites in the South-East part of the Mediterranean South zone [4]	Region	SE-part of MDS
Sweden	excl.		Classes 324 and 333 are mapped in Öland only	Region	Öland
Sweden	add. biodiv data		Due to CLC resolution (25 ha) areas of pastures/grasslands,		

Country	Exclusion or Inclusion	Rule applied in Natura 2000 areas	Rule	Comment	Dataset
			particularly relevant in HNV farmland are mapped. by integrating national grassland data		
United Kingdom	excl.	X	Sparsely vegetated areas (333) are mapped above 500 m	DEM	500 m
United Kingdom	excl.	X	Raised peatbogs (412) are excluded in Ulster [5]	Region	Ulster (= Norther Ireland)
United Kingdom	excl.		The agricultural area in Scotland is identified using LPIS data (exclude all areas outside LPIS-mask)	GIS-file	LPIS Scotland[5]
Croatia	incl.		211 arable land in area important for Falco cherrug	GIS-file	Falco cherrug
Croatia	incl.		211 permanently irrigated areas are included on sites important for relevant bird species	GIS file	211 selection
Croatia	incl.		212 permanently irrigated areas are included on sites important for relevant bird species	GIS-file	212 selection
Croatia	incl.		512 water bodies and adjacent 411 vegetation for extensive carp fishponds (water fringe and high floating vegetation)	GIS-file	Carp fishponds

3.5 BIODIVERSITY DATA LAYERS WITH EUROPEAN COVERAGE

3.5.1 Natura 2000

In order to use the Natura 2000 database[6] for the HNV farmland area project, the following steps had to be taken (see Paracchini et al. 2008):

[5] In Scotland as in several countries, the use of LPIS to select agricultural land is imperfect, as some agricultural land is not recognised on LPIS.

[6] In the north of Europe (N of 65,5 degrees) all Natura 2000 sites were excluded according to national comments (Finland, Sweden).

- Identification of species and habitats that require/prefer (extensive) agricultural management;
- Selection of sites that host such species and habitats;
- Extraction of relevant data from the Natura 2000 database and their utilization in the project.

Ostermann (1998) analysed 198 habitat types listed in Annex I of the Directive 92/43 (Habitats Directive) and he identified 28 'habitat types of the Habitats Directive, whose Favourable Conservation Status is likely to be threatened by the abandonment of rural practices' and 29 habitat types 'which are likely to have their origin in rural practices'.

Overall 53 habitat types that depend on agricultural activities are presented in annex 6.3.

Only sites those have been selected for which at least one Annex I habitat type related to agricultural activities is recorded. Once the Natura 2000 sites had been selected, relevant agricultural areas within the site boundaries were mapped according on the basis of agricultural CORINE Land Cover classes (see list presented in annex 6.4).

For the current exercise the updated NATURA 2000 version (December 2010) was used to provide information on protected sites in Europe. For Croatia national experts used Emerald network/proposed NATURA 2000 and extracted Annex I habitat types based on the Map of habitat types of Croatia from 2004 (1:100.000).

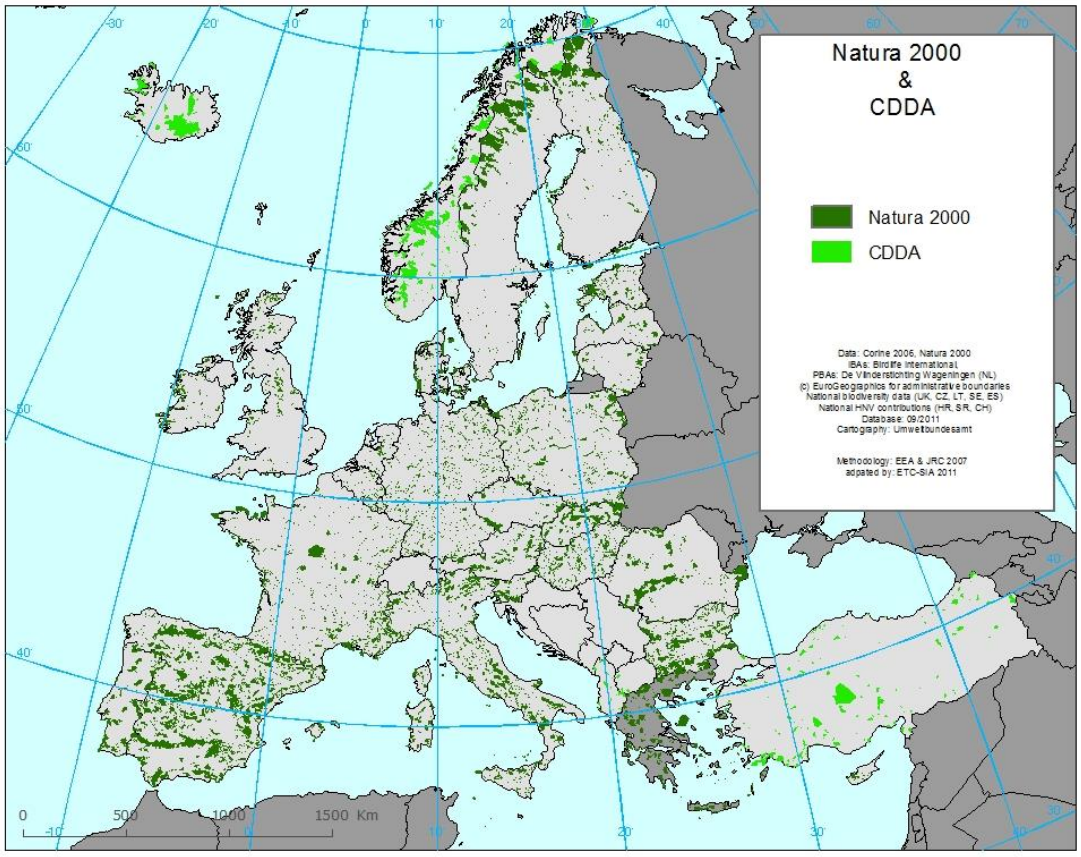

Figure 3: Natura 2000 sites (Version; Dec 2010) and comparable CDDA sites for those countries, where Natura 2000 sites were not available[7]

[7] For most of the Balkan countries the site boundaries were not yet reported within CDDA 2011

3.5.2 Important Bird Areas (IBAs)

Key bird species were already identified in HNV 2000 methodology to extract those IBA-sites that are of relevance for HNV. The initial list of bird species has not been changed (Paracchini et al. 2008), although there might be additional bird species especially in the Balkan[8] countries that could contribute to HNV selection (these data were not available).

The procedure used to select IBAs for the assessment of HNV farmland is described in detail in Paracchini et al. 2008:

1. The starting point was the list of 173 European birds identified as priority species of agricultural and grassland habitats by Tucker & Evans (1997), based on their threat status and the importance of these habitats to them during their annual cycle.
2. Species that do not occur regularly in the wild in the EU-27 were excluded.
3. Species for which agricultural and grassland habitats are considered to be relatively unimportant (i.e. used by less than 10% of the European population) were excluded.
4. Species restricted to montane grasslands were excluded, on the grounds that the factors affecting this habitat type are different to those affecting other agricultural habitats (e.g. arable, steppes, wet grassland, rice cultivation, perennial crops and pastoral woodland).
5. Species listed on Annex I of the EC Birds Directive, and/or considered to have an Unfavourable Conservation Status in Europe (BirdLife International 2004), were retained.
6. Species considered to have a Favourable Conservation Status in Europe (BirdLife International 2004), but to be concentrated in Europe and have a medium or high dependence on agricultural and grassland habitats (i.e. used by more than 10% of the European population) were retained.
7. The resulting list was checked by the EEA, who then circulated it for consultation around national Member State experts involved in the HNV farmland project.
8. The EEA collated Member State feedback, and the species list was revised accordingly[9].

[8] Note: Croatia added several relevant species: *Alectoris graeca* that is highly dependent on Mediterranean grasslands; *Eremophyla alpestris* that is connected to mountain grasslands in southern Croatia, as well as several species highly dependent on extensive carp fishponds with adjacent wetlands: *Chlidonias hybridus, Aythya nyroca, Platalea leucorodia, Egretta alba, Egretta garzetta* and *Ardeola ralloides*.

[9] Note that it has however been suggested that applying one standard species list across Europe may not be appropriate and that the list should be regionally adapted.

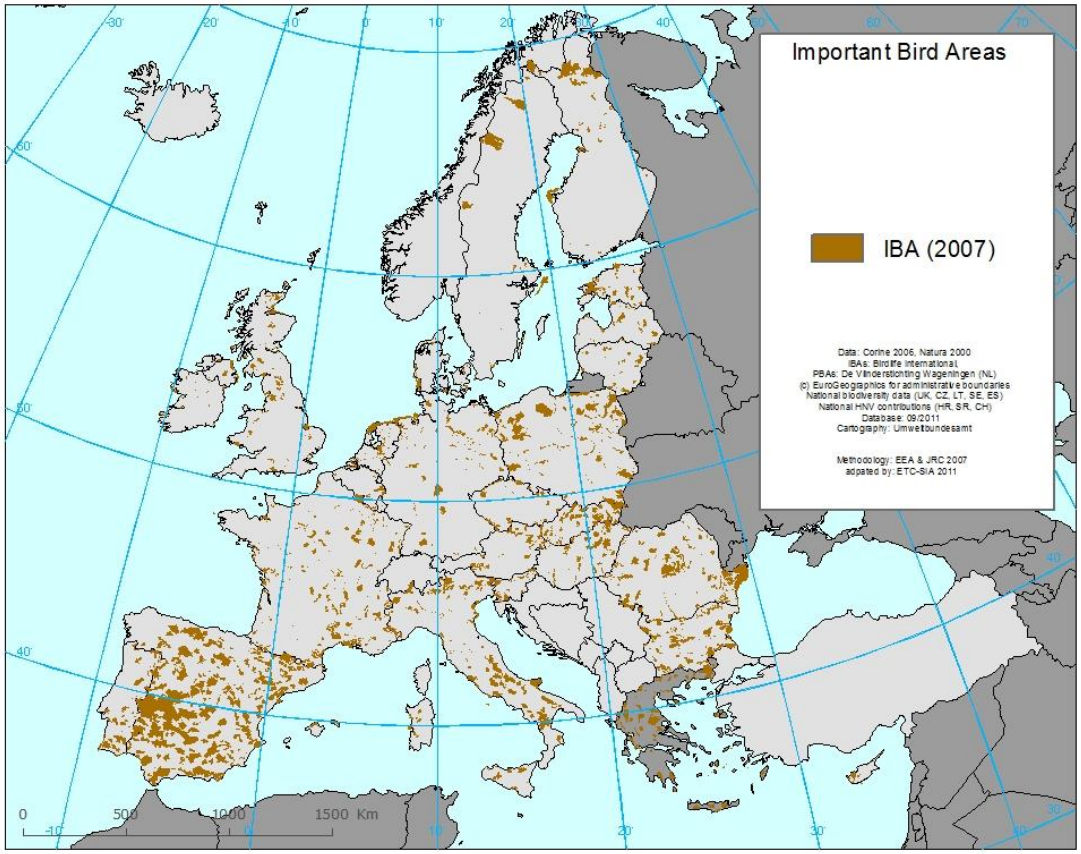

Figure 4: Important Bird areas used for HNV 2006

The final list is presented in annex 6.5.

3.5.3 Prime Butterfly Areas (PBAs)

Similar to the selection of IBAs, some butterfly species are used to select those PBAs that are of relevance for HNV mapping. The initial list of butterfly species has not been changed.

Large efforts have been undertaken in the previous estimation of HNV 2000 to receive a fairly sound dataset on prime butterfly areas. PBA sites were either received as vector data by De Vlinderstichting or digitized using images provided by national experts.

In total 431 PBAs are nominated throughout Europe, from which 282 sites fall inside the area of consideration for the HNV exercise. From the total of 282 PBAs a subset of 178 PBA are relevant for high nature value farmland estimation comprising the selection of butterfly species linked to extensive agricultural practices. However from the selected set of 178 PBA sites that are cited in the HNV 2000 report only 113 sites are available as GIS files for the current study (see annex 6.5).

Chris van Swaay (international expert on PBA) notes that the current knowledge on PBAs is very initial and encompasses only approximately 400 of the most important sites. To come up with comparable quality information's (like the IBAs) the number of sites would

be increased tenfold. Since 2003 large information deficits on PBA were reduced and due to better expert knowledge new sites could be appointed, however the funding for spatial explicit mapping of PBAs is currently not available.

List of selected PBA sites see appendix 6.6.

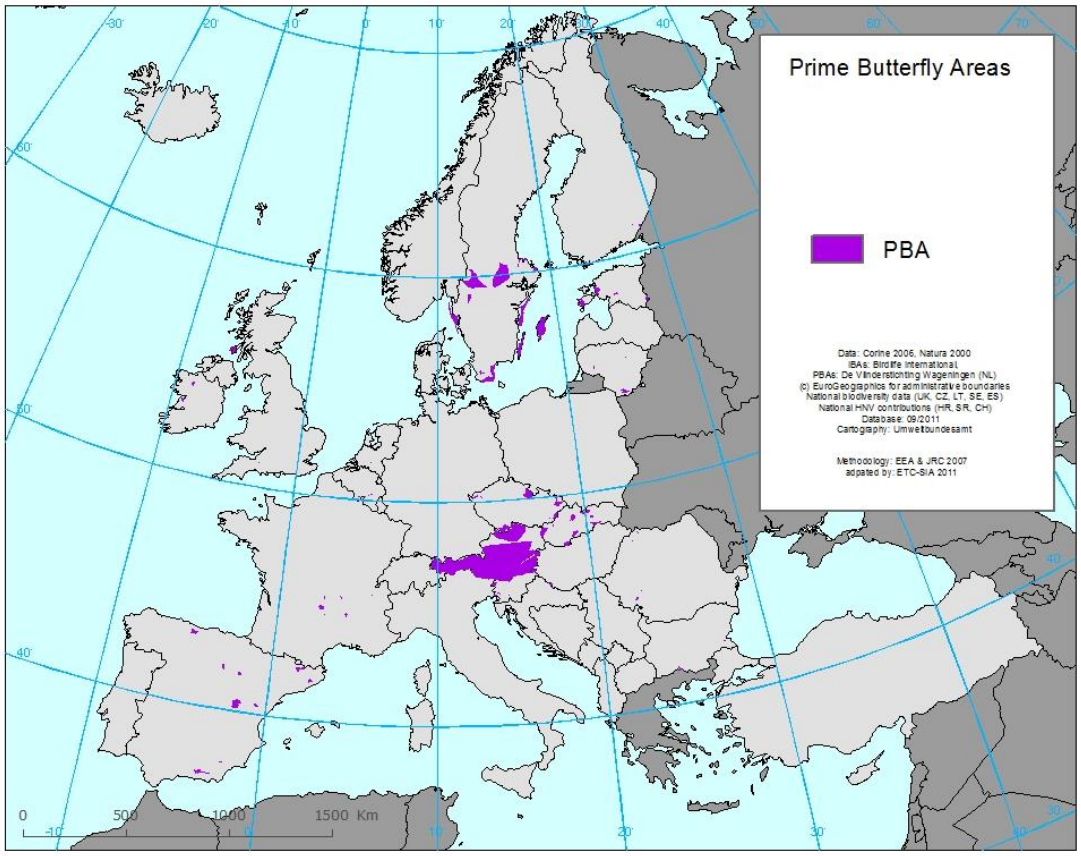

Figure 5: Prime Butterfly areas as input for HNV 2006

3.6 NATIONAL BIODIVERSITY DATA SETS

A number of national biodiversity datasets have been recognised as useful for improving the identification of HNV farmland. The following five countries provided national biodiversity datasets that were used to enrich the original maps generated by EEA:

- ✓ Czech Republic: biotope maps
- ✓ England: 4 data layers consisting of national inventories for semi-natural grassland, moors and heathlands, inland marshes and salt marshes
- ✓ Estonia: Estonian Semi-natural Community Conservation Association (ESCCA) database of semi-natural plant communities
- ✓ Lithuania: national grasslands inventory
- ✓ Sweden: semi-natural meadows and pastures

For the update of HNV farmland new data of the Swedish survey of seminatural meadows and pastures were available and considered in the calculation accordingly.

Table 3: Overview of number and size of polygons from national biodiversity dataset

Country	National biodiversity dataset	Count of polygons	Avg. area [ha]	Minimum area [ha]	Maximum area [ha]	Size distribution
CZ	biotope maps	285,000	0.01	0.000001	7	97 % < 0,1 ha
UK	For England only, use of inventories of semi-natural grasslands, moors, inland waters, salt marshes	28,439	12.718	0.000002	421,333	74% < 10 ha
EE	semi-natural plant communities	8,589	8.3	0.031	753	87% < 10 ha
LT	grassland inventory	5,975	9.1	0.06	3,060	90% < 10 ha
SE	semi-natural meadows and pastures	59,151	4.6	0.05	1,124	92% < 10 ha

The most detail dataset in geometric terms are the biotope maps of the Czech Republic. As these data were used for the preparation of Natura 2000 network the single polygons have an average size of 0,01 ha. Estonia, Lithuania and Sweden have fairly comparable scales – all around average polygon sizes between 5 and 10 ha. The exception is the national biodiversity data for England. As they are derived from four different data sources the size of several polygons is quite large. Nevertheless almost ¾ of the polygons have area sizes below 10 ha.

3.7 SWITZERLAND

The Federal Office of the Environment (FOEN) asked the experts of CSCF (Centre Suisse de cartographie de la faune) to identify the High Nature Value (HNV) farmland areas in Switzerland, according to the principles of the European Environment Agency method (workflow see Figure 2).

In Switzerland, based on a detailed inspection of the CORINE land cover Maps of 2006, the following categories were used:

- Vineyards (221)
- Land principally occupied by agriculture (243)
- Natural grasslands (321)
- Moors and heathland (322)
- Inland marshes (411)

The CLC polygons available for the selected categories have been rasterized at the hectare level (n=595,973).

The Emerald ('Natura 2000 sites' for Switzerland), Important Bird Areas (IBAs) and Prime Butterfly Areas (PBAs) data have not been taken into account since they overlap with other important information (Emerald sites), are too largely distributed (IBAs) or are not available for Switzerland in electronic form (PBAs).

The following information has been added as 'National biodiversity data':

1. The following national inventories (rasterized at the hectare level, n=61,525 distinct hectares):
    a. Grasslands and pastures
    b. Wetlands
    c. Bogs
    d. Alluvial sites

2. Important information from GEOSTAT, the national land cover / land use inventory. The following categories have been taken into account (GEOSTAT is at the hectare level, n=280,230 hectares):
    a. Vineyards (71, 72, 73)
    b. Extensive Orchards and meadow orchards (76, 77)
    c. Grasslands (85, 86, 87, 89)
    d. Woods pastures (13, 18)

3. Species occurrences extracted from the national databases (plants, animals, fungi, moss and lichens. Occurrences were only from data collected after 1980 and with geographical precision better than the hectare level (958,274 observations). Selected species (n=1,703 species) were those chosen for the UZL project (biodiversity conservation in agricultural areas of Switzerland). Each hectare with at least one occurrence was counted (n=139,921 distinct hectares).

These different layers have been overlaid to avoid overlapping.

The final step consists of an aggregation at the level of the square kilometre, counting the HNV hectares in each region of Switzerland.

The data of the Swiss assessment were delivered in the INSPIRE 100*100m grid. The national HNV data were integrated in the European HNV farmland 100*100m database by ETC SIA.

3.8 CROATIA

Based on the request from Environment Agency Austria (Umweltbundesamt GmbH – UBA Vienna), the Croatian Environment Agency (CEA) asked the State Institute for Nature Protection (SINP) to identify the High Nature Value (HNV) farmland areas in Croatia.

The SINP analysis follows EEA/JRC methodology described in Paracchini et al. 2008.

Relevant CLC classes were selected from the CLC map for Croatia (2006) and differentiated per Metzger environmental zones.

Such wide indicative CLC classes have been combined with biodiversity data. The SINP analysis included: distribution of species proposed in Paracchini et al. 2008; distribution of Annex I habitat types (map of habitat types 1:100.000) dependent on agricultural practices, proposed in Halada et al. 2011; as well as Emerald/proposed NATURA 2000 sites for Croatia.

PBA's for Croatia are very indicative and on too large scale so they were not used for HNV farmland analysis in Croatia.

Results were as follows (for details see chapter 6.2.3.): Complete classes of 231 Pastures and 321 Natural grasslands are considered as HNVF Type 1 (semi-natural vegetation). Complete classes of 221, 222 and 223 (Vineyards; Fruit trees and berry plantations; olive groves) are considered as HNV farmland as the large majority is composed of traditional agriculture sites rich with HNV features (stonewalls, margins, natural undergrowth). Complete classes of 322, 323 and 324 (Moors and heathland; Sclerophyllous vegetation; Transitional woodland/shrub) as well as complete classes of 242 and 243 (Complex cultivation patterns; Land principally occupied by agriculture) are considered as indicative HNV farmland. These are often depopulated areas and further analysis of the true Utilised Agricultural Area is needed to define those that are actually used by livestock or still have potential for such use. Regarding classes 211 Non-irrigated arable land and 212 Permanently irrigated land, only a selection was chosen, with sites important for certain threatened farmland birds. Additionally, extensive carp fishponds of great natural value have been included as HNVF for Croatia, already being defined as such on national level (selection of CLC class 512 – water bodies).

Table 4: Inclusion and exclusion of HNV farmland relevant CLC classes in Croatia (SINP 2011)

CLC class	CLC codes	Comments
Non-irrigated arable land	211	Taken into analysis; only sites important for relevant bird species are considered as HNV farmland
Permanently irrigated land	212	Taken into analysis; only sites important for relevant bird species are considered as HNV farmland
Rice fields	213	Not present in Croatia
Vineyards	221	All mapped vineyards are considered as indicative HNV farmland, the large majority being composed of small, traditional vineyards rich with HNV features (stonewalls, margins)
Fruit trees and berry plantations	222	All mapped areas are considered as indicative HNV farmland, on the level of CLC map it is not possible to distinguish traditional old orchards
Olive groves	223	All mapped areas are considered as HNV farmland, the large majority is composed of traditional olive groves rich with HNV features (stonewalls, margins, natural undergrowth)
Pastures	231	All mapped areas are considered as HNV farmland of type 1
Annual crops associated with permanent crops	241	For Croatia only one small polygon of 79 ha has been mapped, so this class is not relevant for analysis
Complex cultivation patterns	242	All mapped areas are considered as HNV farmland of type 2, the large majority represents mosaics of low-intensity agriculture. This class is only indicative, further analysis of really UAA is needed
Land principally occupied by agriculture	243	All mapped areas are considered as HNV farmland of type 2, the large majority represents mosaics of low-intensity agriculture. This class is only indicative, further analysis of really UAA is needed
Agro-forestry areas	244	Not mapped for Croatia

Natural grasslands	321	All mapped areas considered as HNV farmland of type 1
Moors and heathland	322	Heathland areas are potentially used by livestock for grazing. As these areas are today depopulated and mostly without livestock, further analysis of really UAA is needed. Currently all mapped areas are considered as indicative HNVF
Sclerophyllous vegetation	323	This class is only indicative HNVF. As these areas are today depopulated, further analysis is needed to define these that are actually used by livestock or still have potential for such use. Currently all mapped areas are considered as indicative HNVF
Transitional woodland/shrub	324	This class is only indicative HNVF. As these areas are today depopulated, further analysis is needed to define these that are actually used by livestock or still have potential for such use. Currently all mapped areas are considered as indicative HNVF
Sparsely vegetated areas	333	This class is not dependent on agricultural practices in Croatia so it is not considered as farmland
Inland marshes	411	This class is not dependent on agricultural practices in Croatia so it is not considered as farmland, except where occurring in combination with HNV carp fishponds
Peat bogs	412	Not relevant for HNVF analysis, only few small sites exist, with no exploitation activities
Salt marshes	421	This class is not dependent on agricultural practices in Croatia so it is not considered as farmland
Water bodies (only extensive carp fishponds selected)	512	Areas with extensive carp fishponds have been added for Croatia. in combination with 411 vegetation (water-fringe and high floating vegetation), they represent very important HNV areas for breeding, migratory and wintering birds

3.9 SERBIA

The Environmental Protection Agency in Serbia estimated HNV farmland. The national data were delivered as vector file consisting of selected CLC 2006 polygons in national projection (MGI_Balkans_7). These polygons were transformed using MGI_to_ETRS_1989_3 to the European projection and rasterized to the 100*100m INSPIRE grid and integrated in the European HNV farmland 100*100m database by ETC SIA.

The following sources of data for High Nature Value (HNV) Farmland mapping in Serbia were used:

CORINE2006 Land Cover Classes. Data of the European Environment Agency http://www.eea.europa.eu/data-and-maps

Protected Areas (PA): Boundaries of Protected areas were provided by the Institute for nature conservation of Serbia.

Important Bird Areas (IBA): Boundaries of Important Bird Areas were provided by the Institute for nature conservation of Serbia.

Prime Butterfly Areas (PBA): Boundaries of Prime Butterfly areas were provided by the Institute for nature conservation of Serbia.

Important Plant Areas IPA: Data on Important Plant Areas were provided by the Institute for nature conservation of Serbia.

Habitats (H): Descriptive files for Habitat sites were provided by the Agricultural Faculty of Belgrade.

Mapping of High Nature Value Farmland in Serbia was carried out in several steps:

1) Selection of relevant CORINE land cover classes in Serbia
2) Transformation vector data into a national coordinate system

3) Mapping of IPA, PBA, PA and IBA areas
4) Mapping of Habitat areas
5) Creation the overlapping layers
6) Calculation of the HNV farmland area and cartographic processing

The following CORINE classes were selected:

211	Non-irrigated arable land
221	Vineyards
222	Fruit trees and berry plantations
231	Pastures
242	Complex cultivation patterns
243	Land principally occupied by agriculture, with significant areas of natural vegetation
321	Natural grasslands
324	Transitional woodland-shrub
333	Sparsely vegetated
411	Inland Marshes

Classes are allocated for the entire area of Serbia and divided into two groups. First group consists of CORINE classes that are selected throughout the total country area: 231, 321 and 411. The second group consists of the classes that are only selected in special areas (Natura 2000, IBAs, PAs, etc.) : 211, 221, 222, 242, 243, 324, 333.

Data on CORINE categories, IBA, PBA and PA areas were available in vector form and they were transformed into the national coordinate system. Data on the IPA areas are mapped based on the approximate position and surface area data. On the basis of topographic maps and protected areas data the mapping of these areas has been done. The Habitat mapping layer was established similarly.

After creating these layers and their translations into a single coordinate system the overlapping layers with HNV areas were performed:

CORINE areas that belong to classes with the following codes 231, 321 and 411.

Areas that belong to CORINE classes from second group (codes 211, 221, 222,242, 243, 324, 333) and that are located in one of the IPA, PA, IBA, PBA or H layers.

To extract the polygons that fulfill one of the above conditions were made according to their CLC code and to their location within a relevant biodiversity site.

The HNV mapping based on CLC categories does not include all possible HNV farmland in Serbia. This has been observed during the mapping. The correction of certain areas was made according to the digital data. As not all sites were available with digital boundaries

or proper GPS coordinates from literature, these sites could not be used for the identification of the CLC classes from the extended group 2.

3.10 PRESENTATION AND UP SCALING OF RESULTS

One of the main concerns on European level was the reliability of data on local level. The HNV farmland method developed by JRC/EEA was never meant to represent spatially exactly the conditions in reality. It was rather designed to derive an estimate of the likelihood of HNV presence/absence. Therefore the decision has been taken to upscale the original 100*100m data to a resolution mirroring the reliable detail available in the data. Such a resolution corresponds to a reference mapping unit of 1*1 km. The result on the 100*100m grid is calculated as binary value (1…total cell is HNV, 0… total cell is not HNV). For each 1*1 km cell all the values of the 100*100 m cells are summed up. The result is a value between 0-100 that can be interpreted as likelihood and area coverage for the occurrence of HNV farmland in this cell.

A generalization can easily be achieved without losing statistical information, if the original data are available as well in raster format, like the CORINE land cover data. However most of the national biodiversity data are available as vector layers with substantial resolution differences compared to the CORINE data.

As shown above the national biodiversity data are available in a much finer scale than the CORINE Land Cover data. The original approach of JRC/EEA had foreseen a vectorisation of HNV results in order to combine them with the vector data from the national biodiversity data. But vectorization of large data volumes requires substantial GIS and IT facilities that are not available everywhere. Therefore we decided for a trade-off between spatially accurate methods and reasonable IT infrastructure. The national biodiversity data were rasterized into a 100*100m grid based on the cell-centre point. The assumption is that those polygons that are really too small to be represented in a 100*100m grid will anyhow not change the area based result on the 1*1 km up scaled grid level, as for area calculations they can be neglected due to their small size compared to the European wide 1*1 km grid.

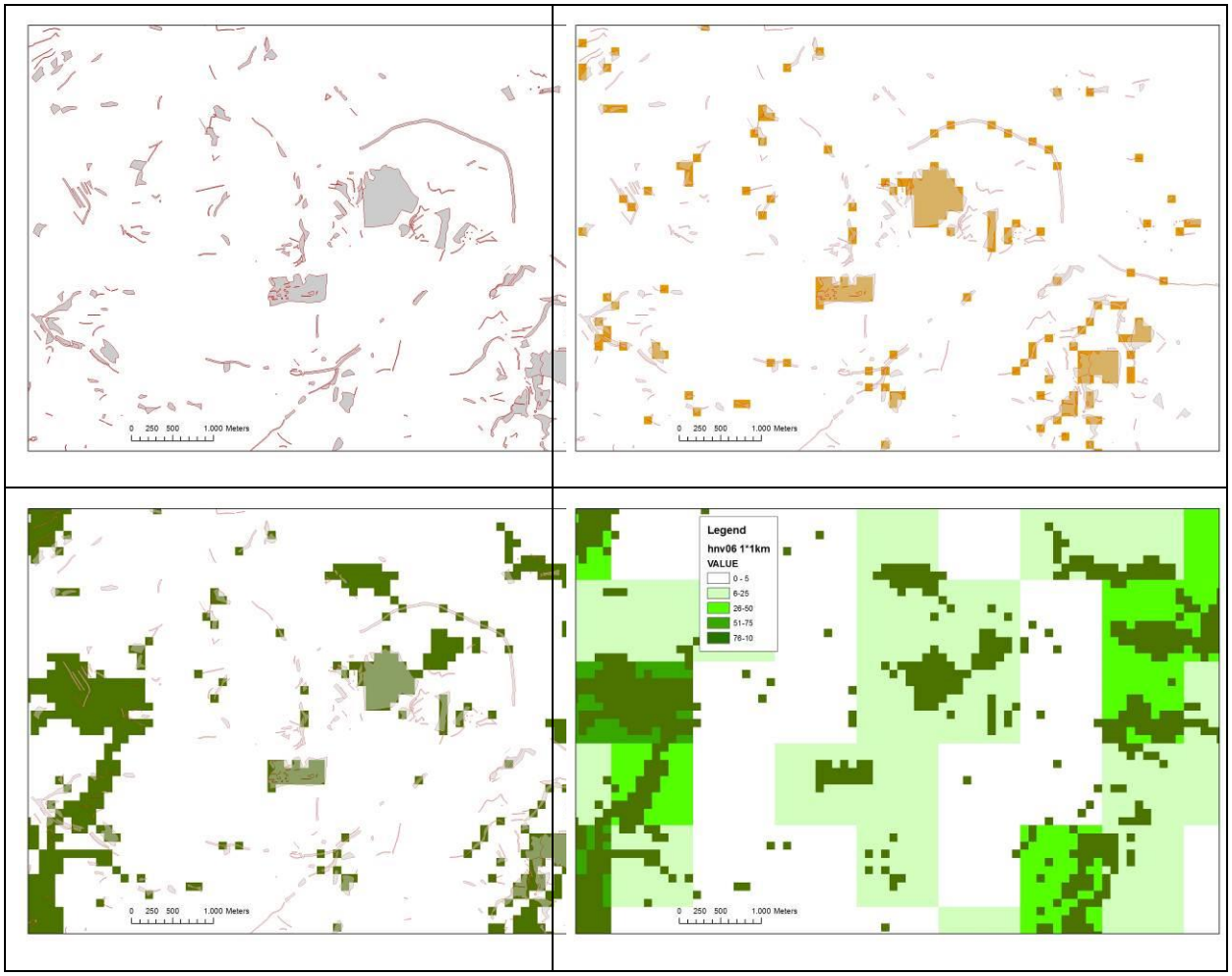

Figure 6: Illustration of up scaling of Czech biotope data; upper left: original Czech biotope data; Upper left original Czech biotope vector data, upper right: biotope data transformed to 100*100m raster data; lower left: HNV 2006 in 100*100m raster version superimposed with biotope data; lower right: finalized 1*1km HNV 2006 data superimposed with 100*100m data.

A consequence of the approach taken is that the maps should be seen as capturing larger contiguous blocks of HNV farmland, while recognizing that landscapes with a scattering of smaller HNV plots will not be reliably captured. In some countries, these landscapes are a major part of the HNV farmland resource.

4 RESULTS

4.1 ESTIMATED DISTRIBUTION OF HNV FARMLAND IN EUROPE

The final results of HNV farmland 2006 are presented in four maps:

- HNV farmland based on **100*100 m** grid cells
  - ✓ Binary value: 1… HNV; 0… no HNV
- HNV farmland based on **1*1 km** grid cells
  - ✓ Total sum of HNV 100*100m grid cells (value between 0-100)
- Area share of HNV farmland per NUTS 2
  Area percentage based on sum of 100*100m grid in relation to total number of 100*100m grid cells per NUTS 2 unit
  - ✓ Expressed in **10% classes**
  - ✓ Expressed in **20% classes**

As explained above, these maps are a reflection mainly of larger blocks of Type 1 HNV farmland (predominantly semi-natural farmland), and of Type 3 areas (supporting populations of species of conservation concern, with a predominance of bird data). Type 2 HNV farmland mosaics are not captured well by the maps.

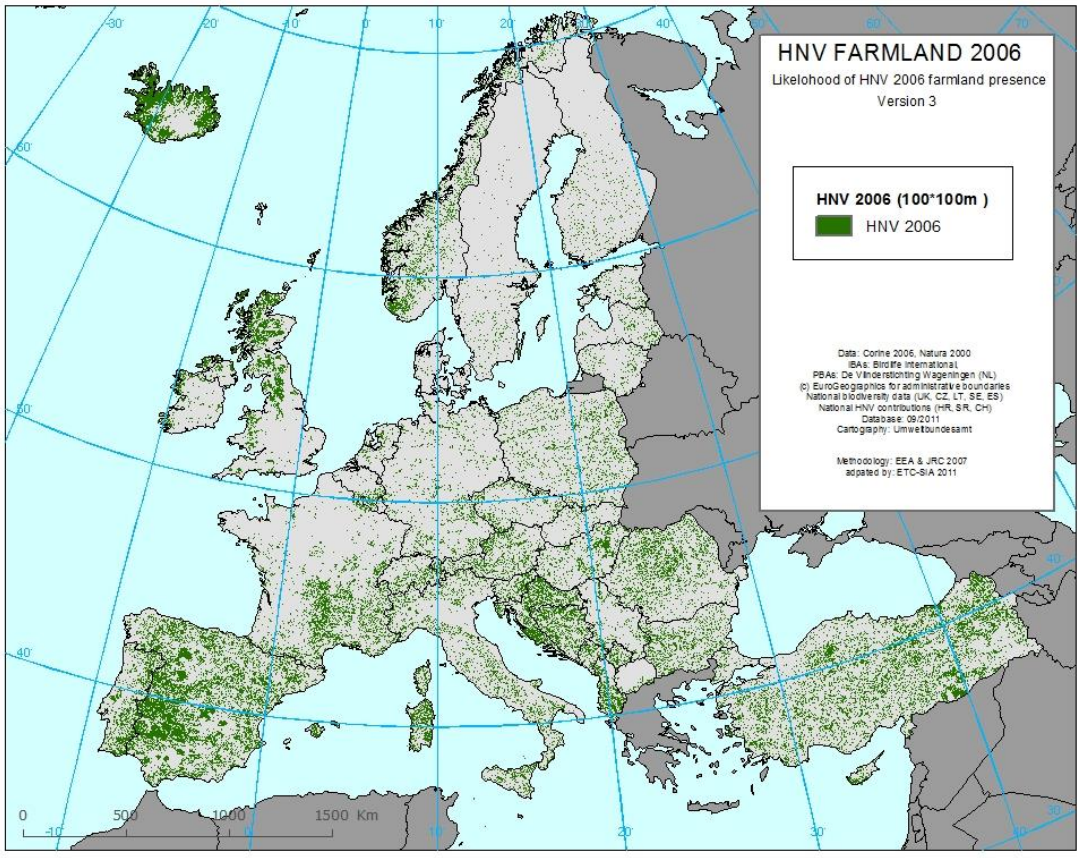

Figure 7: Likelihood of HNV 2006 presence in Europe (100*100 m grid)

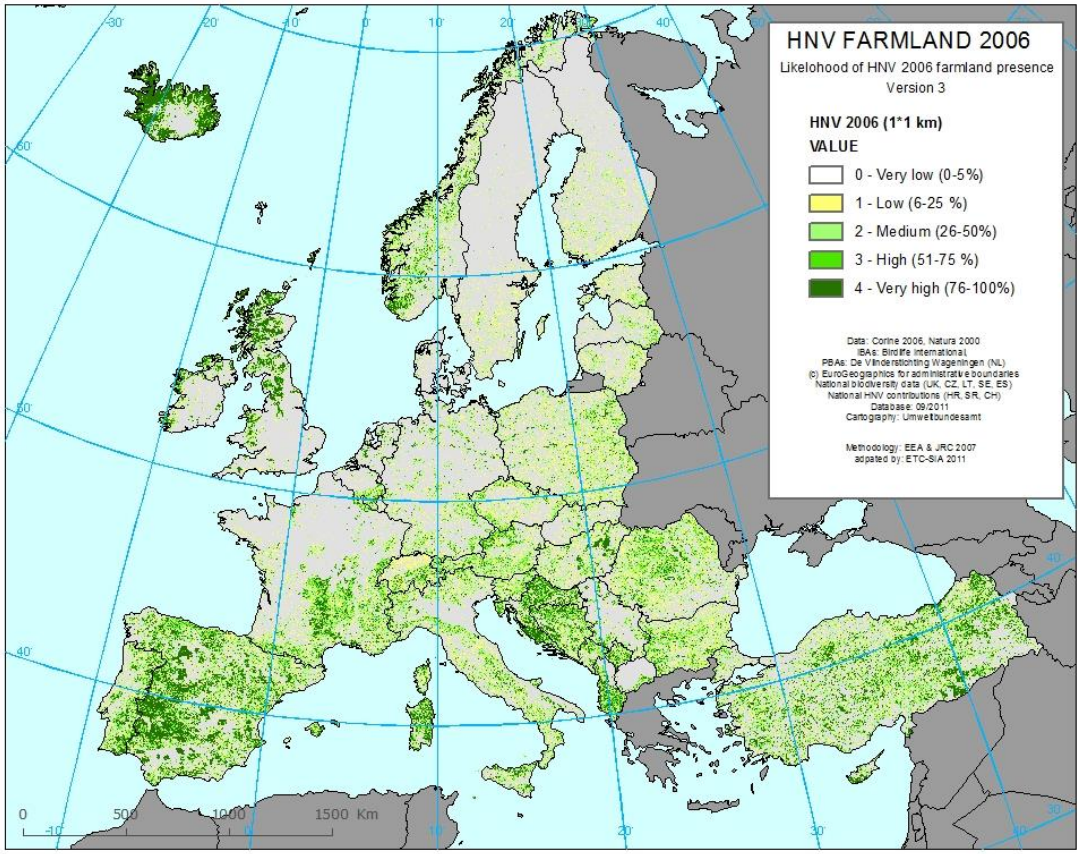

Figure 8: Likelihood of HNV 2006 presence in Europe (1 km grid)

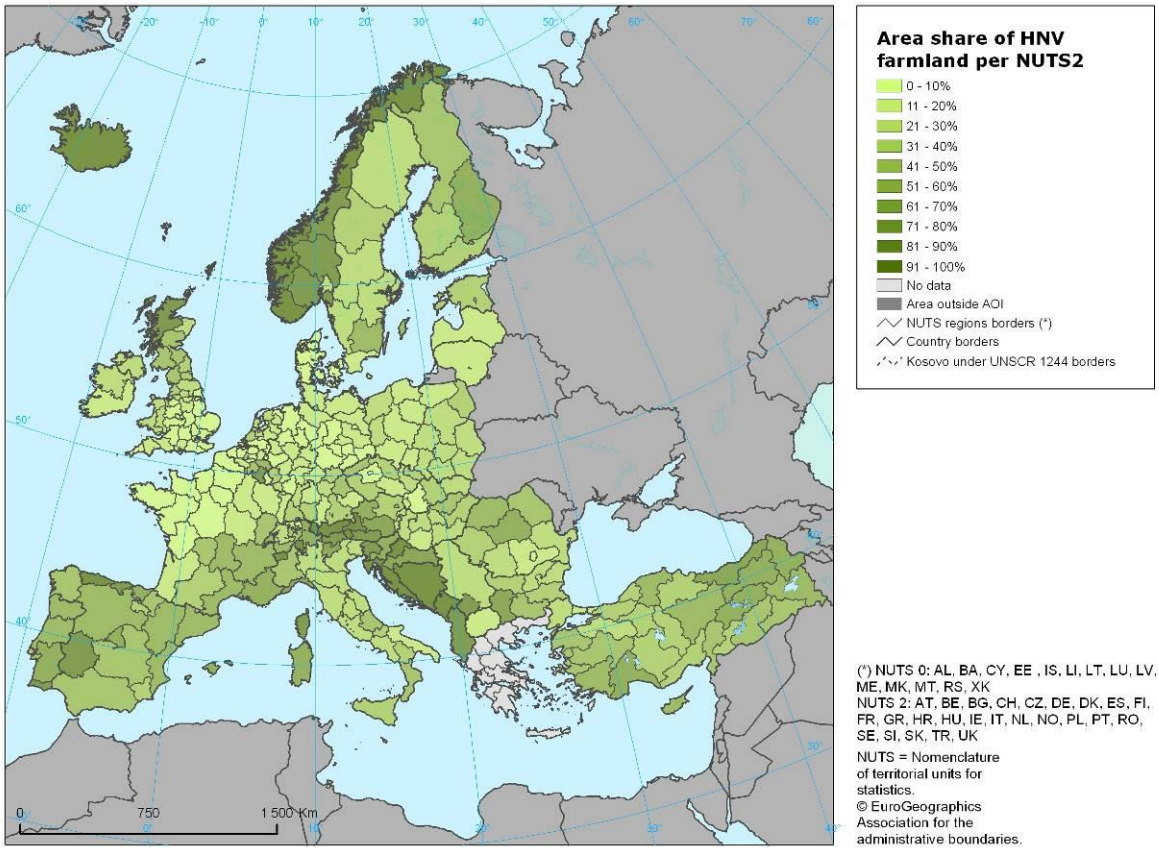

Figure 9: Share of HNV farmland per utilized agricultural area (UAA) per NUTS 2 area (in 10% gradation)

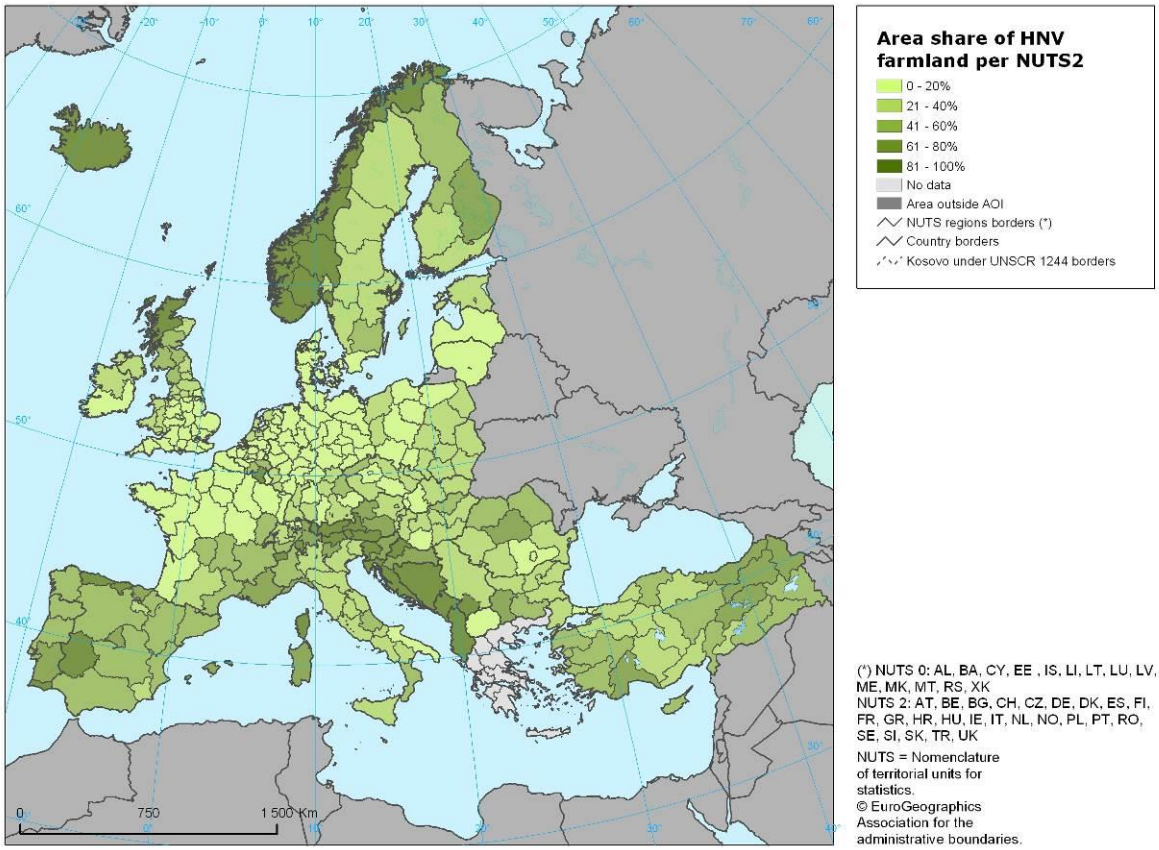

Figure 10: Share of HNV farmland per utilized agricultural area (UAA per NUTS 2 area (in 20% gradation)

4.2 ESTIMATING THE SHARE OF HNV FARMLAND IN FARMED AREA

	col1	col2	col3	col4	col5
Country	HNV 2006 farmland area derived from this study	Agricultural land (CLC 2006 agricultural classes + HNV areas)	Utilized agricultural area - UAA- from EUROSTAT	Area share of HNV (col1/col2) in %	Discrepancy (col2/col3) in %
Albania	1,231,102	1,531,030	1,121,000	80.4	136.6
Austria	2,140,879	3,340,014	3,189,120	64.1	104.7
Bosnia and Herzegovina	2,056,975	2,209,639	1,670,000	93.1	132.3
Belgium	435,153	1,780,001	1,374,450	24.4	129.5
Bulgaria	2,578,005	6,745,380	3,050,730	38.2	221.1
Switzerland	884,778	1,924,777	1,056,690	46.0	182.2
Cyprus	343,209	629,220	146,000	54.5	431.0
Czech Republic	1,190,319	4,625,715	3,518,070	25.7	131.5
Germany	3,248,177	21,508,158	16,931,890	15.1	127.0
Denmark	191,262	3,433,650	2,662,590	5.6	129.0
Estonia	531,554	1,605,575	906,830	33.1	177.1
Spain	18,820,501	33,698,696	24,834,240	55.8	135.7
Finland	1,268,980	2,992,428	2,292,280	42.4	130.5
France	8,023,118	35,204,602	27,355,830	22.8	128.7
Croatia	2,955,012	3,285,969	978,670	89,9	335,8
Hungary	1,935,454	6,768,833	4,228,580	28.6	160.1
Ireland	1,154,495	5,729,074	4,139,240	20.2	138.4
Iceland	6,155,976	6,156,311	120,000	100.0	5130.3
Italy	6,196,451	18,393,993	12,744,200	33.7	144.3
Liechtenstein	81	5,706	3,531	1.4	161.6
Lithuania	640,277	4,011,830	2,648,950	16.0	151.4
Luxembourg	13,637	140,317	130,880	9.7	107.2
Latvia	569,534	2,848,613	1,773,840	20.0	160.6
Montenegro	465,414	469,682	516,470	99.1	90.9
FYR of Macedonia	196,688	1,158,067	1,077,000	17.0	107.5
Malta	1,034	15,666	10,330	6.6	151.7
Netherlands	390,551	2,570,614	1,914,320	15.2	134.3
Norway	5,966,735	6,601,527	1,031,990	90.4	639.7
Poland	4,488,811	19,750,026	15,477,190	22.7	127.6
Portugal	2,854,853	4,881,341	3,357,030	58.5	145.4
Romania	5,221,251	14,401,453	13,753,050	36.3	104.7
Serbia	1,003,818	4,867,569	5,053,000	20.6	96.3
Sweden	1,166,103	4,311,707	3,118,010	27.0	138.3
Slovenia	570,551	754,220	488,770	75.6	154.3
Slovakia	479,205	2,413,272	1,936,620	19.9	124.6
Turkey	19,810,869	42,973,114	39,504,081	46.1	108.8
United Kingdom	5,376,637	19,281,655	16,130,520	27.9	119.5
Kosovo (under UNSCR1244/99)	497,705	610,960	539,000	81.5	113.4
Total	**111,022,899**	**293,630,403**	**220,784,992**	**41.2**	**160.9**

Table 5: HNV farmland share per country and relation between UAA and CLC agricultural classes (Greece not included)

The current approach relies to a large degree on CORINE land cover data to estimate the distribution of HNV farmland in Europe. The attempt faces two crucial constraints as indicated in Paracchini et al (2008). The one is the uncertainty in the data on the distribution and extent of HNV farmland in different countries and the other issue is to find comparable data for agricultural land. The uncertainty of this approach is described in the report accordingly.

The HNV farmland of each NUTS2 area was re-calculated. The area of farmland is indicated as the total area belonging to the CLC agricultural classes (the 11 agricultural classes of CORINE level 3 and parts of natural grasslands) plus identified HNV areas outside these classes. This provides a better basis for comparison than the official UAA which do not fully capture HNV farmland in different environmental zones in Europe. The results of each NUTS area were summed up per member state to derive national figures (see table above).

The resulting estimates of share of HNV farmland in farmed area per NUTS 2 are therefore considered to be comparable across the EU Member States covered (see annex 6.7 for further details). Given the often large differences between UAA as derived from agricultural statistics and agricultural area derived from CLC, however, the estimated shares of HNV farmland under this approach cannot be directly transposed to official UAA. Especially in those areas with high proportions of extensive agricultural practices the difference between the CLC & HNV based calculation of agricultural area and the UAA can be very large. This occurs in wide areas of extensive grazing in the northern countries (Scotland, Iceland, Norway) and many Balkan and Mediterranean countries (Croatia, Bulgaria, Cyprus). Table provides an overview of the relationship (column 4) between the agricultural area as estimated based on CLC (column 2) and that derived from UAA (column 3) per country, and should guide the user in better understanding the results presented in column 5 on the area share of HNV farmland as calculated purely on the basis of data derived from CLC.

The area share of HNV farmland per NUTS 2 according to discrepancies between UAA and CLC are illustrated in the maps in annex 6.8.

In conclusion, whereas the pan-European HNV farmland map 2006 can be considered an important advance from the previous version, several challenges remain to be tackled. These can be summarized as follows:

- Differentiating HNV from non-HNV farmland within broad CORINE CLC such as Pastures, Fruit trees and orchards, Olives, Arable. Proxy criteria such as altitude and soil types have been applied, but in some situations are far from ideal.
- National data sets (e.g. semi-natural grassland and orchard inventories) can help greatly to resolve this issue, but only exist for some countries at present. The issue of what land is actually in farming use needs to be resolved. The LPIS/IACS are the natural tool for addressing this issue, but works needs to be done in the majority of countries to make these systems accurate and to ensure important HNV farmland is not excluded from the recognized UAA.
- Further progress is needed to harmonise between the JRC/EEA mapping and national work in the context of CMEF indicators. In some cases, data could be integrated fully, in other cases the different data and approaches can be applied in parallel to provide a more complete picture.

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6 ANNEX

6.1 ANNEX – CORINE LAND COVER CLASSIFICATION SYSTEM

LEVEL 1	LEVEL 2		LEVEL 3
1. Artificial Surface	1.1 Urban fabric	1	1.1.1 Continuous urban fabric
		2	1.1.2 Discontinuous urban fabric
	1.2 Industrial, Commercial and transport units	3	1.2.1 Industrial or commercial units
		4	1.2.2 Road and rail networks and associated land
		5	1.2.3 Port Areas
		6	1.2.4 Airports
	1.3 Mines, dumps and construction sites	7	1.3.1 Mineral extraction sites
		8	1.3.2 Dump sites
		9	1.3.3 Construction sites
	1.4 Artificial non-agricultural vegetated areas	10	1.4.1 Green urban areas
		11	1.4.2 Sport and leisure facilities
2. Agricultural areas	2.1 Arable land	12	2.1.1 Non-irrigated arable land
		13	2.1.2 Permanently irrigated land
		14	2.1.3 Rice fields
	2.2 Permanent crops	15	2.2.1 Vineyards
		16	2.2.2 Fruit trees and berry plantations
		17	2.2.3 Olive groves
	2.3 Pastures	18	2.3.1 Pastures
	2.4 Heterogeneous agricultural areas	19	2.4.1 Annual crops associated with permanent crops
		20	2.4.2 Complex cultivation patterns
		21	2.4.3 Land principally occupied by agriculture, with significant areas of natural vegetation
		22	2.4.4 Agro-forestry areas
3. Forest and semi-natural areas	3.1 Forests	23	3.1.1 Broad-leaved forest
		24	3.1.2 Coniferous forest
		25	3.1.3 Mixed forest
	3.2 Scrub and/or herbaceous vegetation associations	26	3.2.1 Natural grassland
		27	3.2.2 Moors and heathland
		28	3.2.3 Sclerophyllous vegetation
		29	3.2.4 Transitional woodland-scrub
	3.3 Open spaces with little or no vegetation	30	3.3.1 Beaches, dunes, sands
		31	3.3.2 Bare rocks
		32	3.3.3 Sparsely vegetated areas
		33	3.3.4 Burnt areas
		34	3.3.5 Glaciers and perpetual snow
4. Wetlands	4.1 Inland wetlands	35	4.1.1 Inland marshes
		36	4.1.2 Peat bogs
	4.2 Coastal Wetlands	37	4.2.1 Salt marshes
		38	4.2.2 Salines
		39	4.2.3 Intertidal flats
5. Water bodies	5.1 Continental waters	40	5.1.1 Water courses
		41	5.1.2 Water bodies
	5.2 Marine waters	42	5.2.1 Coastal lagoons
		43	5.2.2 Estuaries
		44	5.2.3 Sea and ocean

Highlighted classes are those related to HNV farmland

6.2 ANNEX - CLC CLASS RESELECTION RULES

6.2.1 Norway

CLC	CLC codes	Atlantic North	Alpine North	Continental	Boreal	Nemoral
Non-irrigated arable land	211	0	0	0	0	0
Permanently irrigated land	212	0	0	0	0	0
Rice fields	213	0	0	0	0	0
Vineyards	221	0	0	0	0	0
Fruit trees and berry plantations	222	0	0	0	0	0
Olive groves	223	0	0	0	0	0
Pastures	231	231	231	231	231	231
Annual crops associated with permanent crops	241	0	0	0	0	0
Complex cultivation patterns	242	242	242	242	242	242
Land principally occupied by agriculture	243	243	243	243	243	243
Agro-forestry areas	244	0	0	0	0	0
Natural grasslands	321	0	0	0	0	0
Moors and heathland	322	322	322	322	322	0
Sclerophyllous vegetation	323	0	0	0	0	0
Transitional woodland/scrub	324	0	0	0	0	0
Sparsely vegetated areas	333	333	0	0	0	333
Inland marshes	411	411	411	411	411	411
Peat bogs	412	0	0	0	0	0
Salt marshes	421	0	0	0	0	0

Large areas in the Scandinavian mountains are sparsely vegetated, covered with calluna heath and lichen heath. These areas have little or no agricultural value, except has winter areas for domesticated reindeer. Norway and Sweden have applied class 322 (and 333) differently and both ways are technically correct. Sweden has classified these areas as 322 moors and heathland.
Norway has classified the same type of areas as 333 sparsely vegetated areas and reserved class 322 for the richer Dwarf shrub heaths (often interspersed with forb meadows), which are important summer pastures for sheep and to some extent also cattle. In Norway outfield grazing is important and mostly found in mountain areas. It is therefore correct o include 322 as HNV farmland in Norway

.[10]

[10] High discrepancy of UAA an CLC agricultural classes

6.2.2 Iceland

CLC	CLC codes	
Non-irrigated arable land	211	211
Permanently irrigated land	212	**0**
Rice fields	213	**0**
Vineyards	221	**0**
ruit trees and berry plantations	222	**0**
Olive groves	223	**0**
Pastures	231	231
Annual crops associated with permanent crops	241	**0**
Complex cultivation patterns	242	242
Land principally occupied by agriculture	243	243
Agro-forestry areas	244	0
Natural grasslands	321	321
Moors and heathland	322	322
Sclerophyllous vegetation	323	0
Transitional woodland/scrub	324	0
Sparsely vegetated areas	333	333
Inland marshes	411	411
Peat bogs	412	412
Salt marshes	421	421

322 include moss and in particular moss covered lava fields that are totally unusable badlands (i.e. no grazing or any other use is possible). Although these recent lava fields are quite extensive and (by far) the largest part of class 322 is ordinary heathland and open for grazing. (it will be a future task to separate moos and heathland but until then class 322 has to be included in HNV as whole).

412 in Iceland extensively used for grazing.

6.2.3 Croatia

CLC class	CLC codes	Mediterranean North	Mediterranean Mountains	Alpine South	Pannonian	Continental
Non-irrigated arable land	211	0	0	0	0	0
Permanently irrigated land	212	0	0	0	0	0
Rice fields	213	0	0	0	0	0
Vineyards	221	221	221	221	221	221
Fruit trees and berry plantations	222	222	222	0	222	222
Olive groves	223	223	223	0	0	0
Pastures	231	231	231	231	231	231
Annual crops associated with permanent crops	241	0	0	0	0	0
Complex cultivation patterns	242	242	242	242	242	242
Land principally occupied by agriculture	243	243	243	243	243	243
Agro-forestry areas	244	0	0	0	0	0
Natural grasslands	321	321	321	321	0	321
Moors and heathland	322	322	322	322	0	0
Sclerophyllous vegetation	323	323	323	323	0	0
Transitional woodland/shrub	324	324	324	324	324	324
Sparsely vegetated areas	333	0	0	0	0	0
Inland marshes	411	0	0	0	411	411
Peat bogs	412	0	0	0	0	0
Salt marshes	421	0	0	0	0	0
Water bodies	512	0	0	0	512	512

Relevant as HNVF for Croatia:
211:only sites important for relevant bird species are considered as HNV farmland (area of Falco Cherrug)

212: only sites important for relevant bird species are considered as HNV farmland

411: Inland marshes-adjacent to extensive carp fishponds

512: only extensive carp fishponds selected -in combination with 411 vegetation (water-fringe and high floating vegetation), they represent very important HNV areas for breeding, migratory and wintering birds

322 Heathland areas are potentially used by livestock for grazing. As these areas are today depopulated and mostly without livestock, further analysis of really UAA is needed. Currently all mapped areas are considered as indicative HNVF.

323 This class is only indicative HNVF. As these areas are today depopulated, further analysis is needed to define these that are actually used by livestock or still have potential for such use. Currently all mapped areas are considered as indicative HNVF.

324 This class is only indicative HNVF. As these areas are today depopulated, further analysis is needed to define those that are actually used by livestock or still have potential for such use. Currently all mapped areas are considered as indicative HNVF.

That leads to high discrepancies of CLC agri and UAA area.

6.2.4 Albania, FYR of Macedonia, Kosovo under UNSCR 1244/99, Montenegro

CLC class	CLC codes	Alpine South	Continental	Mediterranean Mountains	Mediterranean North	Pannonian
Non-irrigated arable land	211	0	0	0	0	0
Permanently irrigated land	212	0	0	0	0	0
Rice fields	213	0	0	0	0	0
Vineyards	221	0	0	0	0	0
Fruit trees and berry plantations	222	222	0	222	0	0
Olive groves	223	0	0	223	0	0
Pastures	231	231	231	231	231	231
Annual crops associated with permanent crops	241	0	0	241	241	0
Complex cultivation patterns	242	242	242	242	242	0
Land principally occupied by agriculture	243	243	243	243	243	243
Agro-forestry areas	244	0	0	244	0	0
Natural grasslands	321	321	321	321	321	321
Moors and heathland	322	322	322	322	322	322
Sclerophyllous vegetation	323	0	323	323	0	0
Transitional woodland/shrub	324	0	324	0	0	324
Sparsely vegetated areas	333	0	0	0	0	333
Inland marshes	411	411	411	411	411	411
Peat bogs	412	0	0	0	0	0
Salt marshes	421	0	421	421	421	421

6.2.5 Bosnia and Herzegovina

CLC class	CLC codes	Alpine South	Continental	Mediterranean Mountains	Mediterranean North	Pannonian
Non-irrigated arable land	211	0	0	0	0	0
Permanently irrigated land	212	0	0	0	0	0
Rice fields	213	0	0	0	0	0
Vineyards	221	0	0	0	0	0
Fruit trees and berry plantations	222	222	0	222	0	0
Olive groves	223	0	0	223	0	0
Pastures	231	231	231	231	231	231
Annual crops associated with permanent crops	241	0	0	241	241	0
Complex cultivation patterns	242	242	242	242	242	0
Land principally occupied by agriculture	243	243	243	243	243	243
Agro-forestry areas	244	0	0	244	0	0
Natural grasslands	321	321	321	321	321	0
Moors and heathland	322	0	0	0	0	0
Sclerophyllous vegetation	323	0	0	0	0	0
Transitional woodland/shrub	324	0	324	0	0	324
Sparsely vegetated areas	333	0	0	0	0	0
Inland marshes	411	411	411	411	411	411
Peat bogs	412	0	0	0	0	0
Salt marshes	421	0	0	0	0	0

6.2.6 Turkey

CLC classes	CLC codes	Black sea	Marmara	Agean	Mediterenean	Mediterranean Transition	Central Anatolia	Eastern Anatolia	South EAST Anatolia
Non-irrigated arable land	211	0	0	0	0	0	211	211	211
Permanently irrigated land	212	212	212	212	212	212	212	212	212
Rice fields	213	213	213	213	213	213	213	0	213
Vineyards	221	0	221	221	0	0	221	221	0
Fruit trees and berry plantations	222	0	0	0	222	0	222	0	0
Olive groves	223	0	223	223	223	0	0	0	0
Pastures	231	231	231	231	231	231	231	231	231
Annual crops associated with permanent crops	241	0	0	0	0	0	0	0	0
Complex cultivation patterns	242	242	242	242	0	242	242	0	0
Land principally occupied by agriculture	243	243	243	243	243	243	243	243	243
Agro-forestry areas	244	0	0	0	244	0	0	0	0
Natural grasslands	321	321	321	321	321	321	321	321	321
Moors and heathland	322	322	322	322	322	322	0	0	0
Sclerophyllous vegetation	323	0	323	323	323	323	323	323	323
Transitional woodland/shrub	324	0	0	324	324	324	324	0	0
Sparsely vegetated areas	333	0	0	0	0	0	333	333	333
Inland marshes	411	411	411	411	411	411	0	0	0
Peat bogs	412	0	0	0	0	0	0	0	0
Salt marshes	421	421	421	421	421	0	421	0	0

6.2.7 Switzerland

See national HNV farmland assessment chapter.

6.2.8 Serbia

See national HNV farmland assessment chapter.

6.3 ANNEX - REVISED LIST OF HABITATS FROM ANNEX I OF THE HABITAT DIRECTIVE DEPENDING OR ASSOCIATED WITH EXTENSIVE AGRICULTURAL PRACTICES

The table below contains the final selection by the EEA of habitats that are characteristic of HNV farmland as they generally depend on extensive farming practices. These habitats have been grouped into two categories: those that clearly fulfil the conditions to be listed (green), and those where doubts exist or the relationship with extensive farming practices only holds true for part of their distribution in Europe (yellow).

The latter ones are also marked with a ° and were not considered by the EEA/JRC in the selection of relevant Natura 2000, IBA and PBA sites.

Notes: D – degree of habitat dependence on agricultural practices (usually extensive ones):

f – fully dependent; p - partly dependent, the agricultural practices prolong the habitat existence or enlarge its area of distribution.

Code	Habitat name	D	Comment
1330 °	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	f *	* some types only
1340	Inland salt meadows	p	
1530	Pannonic salt steppes and salt marshes	p	
1630	Boreal Baltic coastal meadows	p	
2130 °	Fixed coastal dunes with herbaceous vegetation (grey dunes)	p	* at least some sub-types dependent on grazing
2140 °	Decalcified fixed dunes with Empetrum nigrum	p	
2150 °	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	p	
2160 °	Dunes with Hippophae rhamnoides	p	
2170 °	Dunes with Salix repens ssp. argentea (Salicion arenariae)	p	
21A0	Machairs (* in Ireland)	f	rotational cultivation
2310	Dry sandy heaths with Calluna and Genista	f	
2320	Dry sandy heaths with Calluna and Empetrum nigrum	f	
2330	Inland dunes with open Corynephorus and Agrostis grasslands	f	
2340	Pannonic inland dunes	f	
4010	Northern Atlantic wet heaths with Erica tetralix	f	
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	f	
4030	Dry heaths (all subtypes)	f	
4040	Dry Atlantic coastal heaths with Erica vagans	f	
4090	Endemic oro-Mediterranean heaths with gorse	p	
5130	Juniperus communis formations on heaths or	p	

Code	Habitat name	D	Comment
	calcareous grasslands		
5420	Sarcopoterium spinosum phryganas	p	
5430	Endemic phryganas of the Euphorbio-Verbascion	p	
6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	p	
6120	Xeric sand calcareous grasslands	p	
6140	Siliceous Pyrenean Festuca eskia grasslands	p	
6150	Siliceous alpine and boreal grasslands	p	
6160	Oro-Iberian Festuca indigesta grasslands	p	
6170	Alpine and subalpine calcareous grasslands	p	
6180	Macaronesian mesophile grasslands	p	
6190	Rupicolous pannonic grasslands (Stipo-Festucetalia pallentis)	f	
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)	f	
6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	f	
6230	Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	f	except in natural alpine and sub-alpine grasslands
6240	Sub-pannonic steppic grassland	f	
6250	Pannonic loess steppic grasslands	f	
6260	Pannonic sand steppes	f	
6270	Fennoscandian lowland species-rich dry to mesic grasslands	f	
6280	Nordic alvar and precambrian calcareous flatrocks	f	
62A0	Eastern sub-mediteranean dry grasslands (Scorzoneratalia villosae)	f	
6310	Sclerophyllous grazed forests (dehesas) with Quercus suber and/or Quercus ilex	f	
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	f	
6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion	p	
6430 °	Eutrophic tall herbs	p	some types
6440	Alluvial meadows of river valleys of the Cnidion dubii	f	
6450	Northern boreal alluvial meadows	f	
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	f	
6520	Mountain hay meadows	f	

Code	Habitat name	D	Comment
6530	Fennoscandian wooded meadows	f	
7140 °	Transition mires and quaking bogs	p	
7230	Calcareous (and alkaline) fens	p	
8230 °	Siliceous rocky slopes with pioneer vegetation	p	
8240	Limestone pavements	p	
9070	Fennoscandian wooded pastures	f	

6.4 Annex - Rules for CLC class selection in Natura 2000, IBAs and PBAs

1	1.1.1 Continuous urban fabric
2	1.1.2 Discontinuous urban fabric
3	1.2.1 Industrial or commercial units
4	1.2.2 Road and rail networks and associated land
5	1.2.3 Port Areas
6	1.2.4 Airports
7	1.3.1 Mineral extraction sites
8	1.3.2 Dump sites
9	1.3.3 Construction sites
10	1.4.1 Green urban areas
11	1.4.2 Sport and leisure facilities
12	2.1.1 Non-irrigated arable land (ES - P only)
13	2.1.2 Permanently irrigated land
14	2.1.3 Rice fields (ES - P - I - HU)
15	2.2.1 Vineyards
16	2.2.2 Fruit trees and berry plantations
17	2.2.3 Olive groves
18	2.3.1 Pastures
19	2.4.1 Annual crops associated with permanent crops
20	2.4.2 Complex cultivation patterns
21	2.4.3 Land principally occupied by agriculture, with significant areas of natural vegetation
22	2.4.4 Agro-forestry areas
23	3.1.1 Broad-leaved forest
24	3.1.2 Coniferous forest
25	3.1.3 Mixed forest
26	3.2.1 Natural grassland
27	3.2.2 Moors and heathland
28	3.2.3 Sclerophyllous vegetation
29	3.2.4 Transitional woodland-scrub
30	3.3.1 Beaches, dunes, sands
31	3.3.2 Bare rocks
32	3.3.3 Sparsely vegetated areas
33	3.3.4 Burnt areas
34	3.3.5 Glaciers and perpetual snow
35	4.1.1 Inland marshes
36	4.1.2 Peat bogs
37	4.2.1 Salt marshes
38	4.2.2 Salines
39	4.2.3 Intertidal flats
40	5.1.1 Water courses
41	5.1.2 Water bodies
42	5.2.1 Coastal lagoons
43	5.2.2 Estuaries
44	5.2.3 Sea and ocean

Accepted
Rejected
General rules (Env.zone + Country)
Only in selected Countries

6.5 ANNEX – HNV FARMLAND BIRD SPECIES AND IBA QUALIFYING STATUS

Common name	Scientific name	HNV farmland species	IBA 'C' criteria trigger species in EU27
Black-crowned Night-heron	*Nycticorax nycticorax*	Yes	Yes
White Stork	*Ciconia ciconia*	Yes	Yes
Mute Swan	*Cygnus olor*	Yes (winter)	Yes
Tundra Swan	*Cygnus columbianus*	Yes (winter)	Yes
Whooper Swan	*Cygnus cygnus*	Yes (winter)	Yes
Bean Goose	*Anser fabalis*	Yes (winter)	Yes
Pink-footed Goose	*Anser brachyrhynchus*	Yes (winter)	Yes
Greater White-fronted Goose	*Anser albifrons*	Yes (winter)	Yes
Lesser White-fronted Goose	*Anser erythropus*	Yes (winter)	Yes
Greylag Goose	*Anser anser*	Yes (winter)	Yes
Barnacle Goose	*Branta leucopsis*	Yes (winter)	Yes
Brent Goose	*Branta bernicla*	Yes (winter)	Yes
Red-breasted Goose	*Branta ruficollis*	Yes (winter)	Yes
Garganey	*Anas querquedula*	Yes	Yes
Black-winged Kite	*Elanus caeruleus*	Yes	Yes
Black Kite	*Milvus migrans*	Yes	Yes
Red Kite	*Milvus milvus*	Yes	Yes
Egyptian Vulture	*Neophron percnopterus*	Yes	Yes
Griffon Vulture	*Gyps fulvus*	Yes	Yes
Cinereous Vulture	*Aegypius monachus*	Yes	Yes
Short-toed Snake-eagle	*Circaetus gallicus*	Yes	Yes
Northern Harrier	*Circus cyaneus*	Yes	Yes
Montagu's Harrier	*Circus pygargus*	Yes	Yes
Levant Sparrowhawk	*Accipiter brevipes*	Yes	Yes
Long-legged Buzzard	*Buteo rufinus*	Yes	Yes
Lesser Spotted Eagle	*Aquila pomarina*	Yes	Yes
Greater Spotted Eagle	*Aquila clanga*	Yes	Yes
Eastern Imperial Eagle	*Aquila heliaca*	Yes	Yes
Spanish Imperial Eagle	*Aquila adalberti*	Yes	Yes
Booted Eagle	*Hieraaetus pennatus*	Yes	Yes
Bonelli's Eagle	*Hieraaetus fasciatus*	Yes	Yes
Lesser Kestrel	*Falco naumanni*	Yes	Yes
Common Kestrel	*Falco tinnunculus*	Yes	
Red-footed Falcon	*Falco vespertinus*	Yes	Yes
Lanner Falcon	*Falco biarmicus*	Yes	Yes
Saker Falcon	*Falco cherrug*	Yes	Yes
Black Grouse	*Tetrao tetrix*	Yes	Yes
Chukar	*Alectoris chukar*	Yes	
Red-legged Partridge	*Alectoris rufa*	Yes	
Black Francolin	*Francolinus francolinus*	Yes	
Grey Partridge	*Perdix perdix*	Yes	
Common Quail	*Coturnix coturnix*	Yes	
Spotted Crake	*Porzana porzana*	Yes	Yes
Corncrake	*Crex crex*	Yes	Yes
Common Crane	*Grus grus*	Yes	Yes
Little Bustard	*Tetrax tetrax*	Yes	Yes
Houbara Bustard	*Chlamydotis undulata*	Yes	Yes
Great Bustard	*Otis tarda*	Yes	Yes
Eurasian Oystercatcher	*Haematopus ostralegus*	Yes	Yes
Eurasian Thick-knee	*Burhinus oedicnemus*	Yes	Yes
Cream-coloured Courser	*Cursorius cursor*	Yes	Yes
Collared Pratincole	*Glareola pratincola*	Yes	Yes
Eurasian Golden Plover	*Pluvialis apricaria*	Yes (winter)	Yes
Northern Lapwing	*Vanellus vanellus*	Yes	Yes
Ruff	*Philomachus pugnax*	Yes	Yes
Common Snipe	*Gallinago gallinago*	Yes	Yes

Great Snipe	*Gallinago media*	Yes	Yes
Black-tailed Godwit	*Limosa limosa*	Yes	Yes
Eurasian Curlew	*Numenius arquata*	Yes	Yes
Common Redshank	*Tringa totanus*	Yes	Yes
Black-bellied Sandgrouse	*Pterocles orientalis*	Yes	Yes
Pin-tailed Sandgrouse	*Pterocles alchata*	Yes	Yes
Stock Dove	*Columba oenas*	Yes	
European Turtle-dove	*Streptopelia turtur*	Yes	
Barn Owl	*Tyto alba*	Yes	
Common Scops-owl	*Otus scops*	Yes	
Little Owl	*Athene noctua*	Yes	
Short-eared Owl	*Asio flammeus*	Yes	Yes
European Bee-eater	*Merops apiaster*	Yes	
European Roller	*Coracias garrulus*	Yes	Yes
Eurasian Hoopoe	*Upupa epops*	Yes	
Eurasian Wryneck	*Jynx torquilla*	Yes	
Eurasian Green Woodpecker	*Picus viridis*	Yes	
Syrian Woodpecker	*Dendrocopos syriacus*	Yes	Yes
Dupont's Lark	*Chersophilus duponti*	Yes	Yes
Calandra Lark	*Melanocorypha calandra*	Yes	Yes
Greater Short-toed Lark	*Calandrella brachydactyla*	Yes	Yes
Lesser Short-toed Lark	*Calandrella rufescens*	Yes	
Crested Lark	*Galerida cristata*	Yes	
Thekla Lark	*Galerida theklae*	Yes	Yes
Wood Lark	*Lullula arborea*	Yes	Yes
Eurasian Skylark	*Alauda arvensis*	Yes	
Barn Swallow	*Hirundo rustica*	Yes	
Tawny Pipit	*Anthus campestris*	Yes	Yes
Yellow Wagtail	*Motacilla flava*	Yes	
Rufous-tailed Scrub-robin	*Erythropygia galactotes*	Yes	
Whinchat	*Saxicola rubetra*	Yes	
Common Stonechat	*Saxicola torquatus*	Yes	
Northern Wheatear	*Oenanthe oenanthe*	Yes	
Black-eared Wheatear	*Oenanthe hispanica*	Yes	
Fieldfare	*Turdus pilaris*	Yes (winter)	
Redwing	*Turdus iliacus*	Yes (winter)	
Common Grasshopper-warbler	*Locustella naevia*	Yes	
Eurasian River Warbler	*Locustella fluviatilis*	Yes	
Aquatic Warbler	*Acrocephalus paludicola*	Yes	Yes
Olivaceous Warbler	*Hippolais pallida*	Yes	
Olive-tree Warbler	*Hippolais olivetorum*	Yes	Yes
Orphean Warbler	*Sylvia hortensis*	Yes	
Barred Warbler	*Sylvia nisoria*	Yes	Yes
Common Whitethroat	*Sylvia communis*	Yes	
Red-backed Shrike	*Lanius collurio*	Yes	Yes
Lesser Grey Shrike	*Lanius minor*	Yes	Yes
Great Grey Shrike	*Lanius excubitor*	Yes	
Woodchat Shrike	*Lanius senator*	Yes	
Masked Shrike	*Lanius nubicus*	Yes	Yes
Red-billed Chough	*Pyrrhocorax pyrrhocorax*	Yes	Yes
Eurasian Jackdaw	*Corvus monedula*	Yes	
Rook	*Corvus frugilegus*	Yes	
Eurasian Tree Sparrow	*Passer montanus*	Yes	
Island Canary	*Serinus canaria*	Yes	
Eurasian Linnet	*Carduelis cannabina*	Yes	
Twite	*Carduelis flavirostris*	Yes	
Trumpeter Finch	*Bucanetes githagineus*	Yes	Yes
Yellowhammer	*Emberiza citrinella*	Yes	
Cirl Bunting	*Emberiza cirlus*	Yes	
Ortolan Bunting	*Emberiza hortulana*	Yes	Yes
Reed Bunting	*Emberiza schoeniclus*	Yes	
Black-headed Bunting	*Emberiza melanocephala*	Yes	
Corn Bunting	*Miliaria calandra*	Yes	

6.6 ANNEX - LIST OF SELECTED PBA SITES IN EU-27 MEMBER STATES

In total 282 PBAs were analyzed. 178 PBAs were selected according to the species criteria. However from the principally selected sites only 113 PBAs could be used for the further analysis, as for 65 sites no digital boundaries were available or could be derived (missing GIS boundaries).

AUSTRIA
A-01, A-02, A-03, A-04, A-05

BELGIUM
B-01, B-02

BULGARIA
BG-08, BG-13

CZECH REPUBLIC
CZ-01, CZ-02, CZ-04, CZ-05, CZ-06, CZ-09, CZ-10

GERMANY
Missing GIS-boundaries (not used for HNV 2006): D-01, D-02, D-03, D-04, D-05, D-06, D-07, D-09, D-11, D-12, D-13, D-14, D-15, D-16, D-17, D-18, D-19

SPAIN
E-01, E-02, E-04, E-05, E-06, E-07, E-08, E-09, E-10,
E-11, E-12, E-13, E-14

Missing GIS-boundaries (not used for HNV 2006): E-03

ESTONIA
EST-02, EST-03, EST-04, EST-05, EST-06, EST-07

FRANCE
F-01, F-03, , F-10, , F-16, F-18,
F-21, F-22, F-23,

Missing GIS-boundaries (not used for HNV 2006): F-06, F-07, F-08, F-12, F-13, F-17, F-25, F-26

FINLAND
FIN-02, FIN-03, FIN-04, FIN-06, FIN-11

Missing GIS-boundaries (not used for HNV 2006): FIN-10

GREECE
Missing GIS-boundaries (not used for HNV 2006): GR-02, GR-04, GR-05, GR-06, GR-07, GR-08, GR-09, GR-10

HUNGARY
H-01, H-04, H-05, H-08, H-09, H-10,
H-11, H-12, H-13, H-18, H-19, H-22

ITALY
Missing GIS-boundaries (not used for HNV 2006): I-01, I-02, I-03, I-09, I-10, I-12, I-16, I-17, I-18, I-19, I-20,

I-24, I-26, I-28, I-31, I-32

REPUBLIC OF IRELAND
IRL-01, IRL-03

LUXEMBOURG
Missing GIS-boundaries (not used for HNV 2006): L-01

LITHUANIA
LT-01, LT-02, LT-03, LT-04, LT-05, LT-07, LT-08

THE NETHERLANDS
NL-01, NL-03

PORTUGAL
Missing GIS-boundaries (not used for HNV 2006): P-01, P-02, P-03, P-04, P-05

ROMANIA
RO-05, RO-06, RO-08, , RO-10, RO-11, RO-12, RO-14

Missing GIS-boundaries (not used for HNV 2006): RO-09

SWEDEN
S-01, S-02, S-03, S-06, S-07, S-08, S-09, S-10, S-11, S-12

SLOVAKIA
SK-02, SK-03, SK-04, SK-05, SK-06, SK-08, SK-09, SK-10, SK-11, SK-13

SLOVENIA
SLO-01, SLO-02, SLO-04, SLO-06, SLO-08, SLO-09,
SLO-12, SLO-14, SLO-16, , SLO-18, SLO-19, SLO-20

Missing GIS-boundaries (not used for HNV 2006): SLO-03, SLO-05, SLO-07, SLO-11, SLO-15, SLO-17

UNITED KINGDOM
UK-02, UK-03, UK-05, UK-06

6.7 ANNEX – HNV FARMLAND 2006 –SHARES PER NUTS 2 AND RELATION BETWEEN UAA AND CLC AGRICULTURAL CLASSES

NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
AL	NUTS_0	Albania	1,231,102	1,531,030	1,121,000	80.41	136.58
AT	NUTS_0	Austria	2,140,879	3,340,014	3,189,120	64.10	104.73
AT	AT11	Burgenland (A)	69,822	235,890	188,430	29.60	125.19
AT	AT12	Niederösterreich	348,357	1,026,905	918,360	33.92	111.82
AT	AT13	Wien	2,136	6,782	7,990	31.50	84.88
AT	AT21	Kärnten	234,061	277,255	290,370	84.42	95.48
AT	AT22	Steiermark	385,652	496,373	457,020	77.69	108.61
AT	AT31	Oberösterreich	408,815	598,626	556,720	68.29	107.53
AT	AT32	Salzburg	232,606	232,883	236,520	99.88	98.46
AT	AT33	Tirol	361,599	363,999	435,380	99.34	83.60
AT	AT34	Vorarlberg	97,831	101,301	98,330	96.57	103.02
BA	NUTS_0	Bosnia and Herzegovina	2,056,975	2,209,639	1,670,000	93.09	132.31
BE	NUTS_0	Belgium	435,153	1,780,001	1,374,450	24.45	129.51
BE	BE10	Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest	8	445	310	1.80	143.55
BE	BE21	Prov. Antwerpen	13,882	150,771	89,880	9.21	167.75
BE	BE22	Prov. Limburg (B)	20,375	133,840	84,590	15.22	158.22
BE	BE23	Prov. Oost-Vlaanderen	9,530	209,424	151,550	4.55	138.19
BE	BE24	Prov. Vlaams Brabant	4,946	125,210	87,680	3.95	142.80
BE	BE25	Prov. West-Vlaanderen	15,414	247,924	210,100	6.22	118.00
BE	BE31	Prov. Brabant Wallon	713	73,556	64,690	0.97	113.71
BE	BE32	Prov. Hainaut	29,397	252,839	219,070	11.63	115.41
BE	BE33	Prov. Liège	97,765	192,065	159,820	50.90	120.18
BE	BE34	Prov. Luxembourg (B)	158,496	195,407	146,200	81.11	133.66
BE	BE35	Prov. Namur	84,627	198,520	160,560	42.63	123.64
BG	NUTS_0	Bulgaria	2,578,005	6,745,380	3,050,730	38.22	221.11
BG	BG31	Severozapaden	440,884	1,377,910	614,290	32.00	224.31
BG	BG32	Severen tsentralen	279,319	1,034,830	661,130	26.99	156.52
BG	BG33	Severoiztochen	213,001	1,028,650	655,260	20.71	156.98
BG	BG34	Yugoiztochen	416,668	1,210,816	561,280	34.41	215.72
BG	BG41	Yugozapaden	702,192	997,226	193,350	70.41	515.76
BG	BG42	Yuzhen tsentralen	525,941	1,095,948	365,420	47.99	299.91
CH	NUTS_0	Switzerland	884,778	1,924,777	1,056,690	45.97	182.15
CH	CH01	Région lémanique	189,874	345,677	158,500	54.93	218.09
CH	CH02	Espace Mittelland	160,614	540,656	372,930	29.71	144.98

NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
CH	CH03	Nordwestschweiz	15,139	91,647	83,800	16.52	109.36
CH	CH04	Zürich	14,900	83,423	74,180	17.86	112.46
CH	CH05	Ostschweiz	327,911	545,659	218,960	60.09	249.20
CH	CH06	Zentralschweiz	95,268	228,088	134,330	41.77	169.80
CH	CH07	Ticino	81,072	89,627	13,990	90.45	640.65
CY	NUTS_0	Cyprus	343,209	629,220	146,000	54.55	430.97
CZ	NUTS_0	Czech Republic	1,190,319	4,625,715	3,518,070	25.73	131.48
CZ	CZ01	Praha	1,534	18,325	32,140	8.37	57.02
CZ	CZ02	Střední Cechy	64,337	706,155	547,530	9.11	128.97
CZ	CZ03	Jihozápad	323,683	983,861	734,840	32.90	133.89
CZ	CZ04	Severozápad	205,773	466,300	309,750	44.13	150.54
CZ	CZ05	Severovýchod	237,161	744,295	554,610	31.86	134.20
CZ	CZ06	Jihovýchod	99,637	903,332	735,350	11.03	122.84
CZ	CZ07	Střední Morava	140,686	501,848	393,040	28.03	127.68
CZ	CZ08	Moravskoslezsko	117,508	301,599	210,810	38.96	143.07
DE	NUTS_0	Germany	3,248,177	21,508,158	16,931,890	15.10	127.03
DE	DE1	Baden-Württemberg	473,463	1,865,036	1,436,690	25.39	129.81
DE	DE11	Stuttgart	75,499	615,824	472,100	12.26	130.44
DE	DE12	Karlsruhe	63,813	290,456	207,280	21.97	140.13
DE	DE13	Freiburg	168,129	421,965	325,540	39.84	129.62
DE	DE14	Tübingen	166,022	536,791	431,770	30.93	124.32
DE	DE2	Bayern	969,766	4,047,728	3,211,940	23.96	126.02
DE	DE21	Oberbayern	284,432	947,922	783,990	30.01	120.91
DE	DE22	Niederbayern	95,635	656,245	522,580	14.57	125.58
DE	DE23	Oberpfalz	209,628	520,053	400,090	40.31	129.98
DE	DE24	Oberfranken	128,270	406,136	304,980	31.58	133.17
DE	DE25	Mittelfranken	90,947	429,142	336,890	21.19	127.38
DE	DE26	Unterfranken	56,507	450,883	354,240	12.53	127.28
DE	DE27	Schwaben	104,347	637,347	509,170	16.37	125.17
DE	DE3_5_6	Berlin, Bremen, Hamburg	13,500	43,387	24,750	31.12	175.30
DE	DE30	Berlin	380	5,969	2,250	6.37	265.29
DE	DE50	Bremen	6,659	14,607	8,470	45.59	172.46
DE	DE60	Hamburg	6,461	22,811	14,030	28.32	162.59
DE	DE4	Brandenburg	218,092	1,625,299	1,334,620	13.42	121.78
DE	DE41	Brandenburg - Nordost	100,397	919,942	779,190	10.91	118.06
DE	DE42	Brandenburg-Southwest	117,695	705,357	555,430	16.69	126.99
DE	DE7	Hessen	176,445	1,046,929	778,050	16.85	134.56
DE	DE71	Darmstadt	45,938	330,511	242,100	13.90	136.52
DE	DE72	Gießen	43,509	278,690	203,270	15.61	137.10
DE	DE73	Kassel	86,998	437,728	332,680	19.87	131.58
DE	DE8	Mecklenburg-Vorpommern	241,109	1,622,072	1,348,800	14.86	120.26
DE	DE80	Mecklenburg-Vorpommern	241,109	1,622,072	1,348,800	14.86	120.26
DE	DE9	Niedersachsen	372,967	3,328,595	2,620,130	11.20	127.04
DE	DE91	Braunschweig	24,886	463,870	387,010	5.36	119.86
DE	DE92	Hannover	47,848	618,502	501,810	7.74	123.25
DE	DE93	Lüneburg	190,470	1,046,149	809,750	18.21	129.19
DE	DE94	Weser-Ems	109,763	1,200,074	921,560	9.15	130.22
DE	DEA	Nordrhein-Westfalen	177,620	2,045,837	1,508,960	8.68	135.58

NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
DE	DEA1	Düsseldorf	35,529	307,128	227,100	11.57	135.24
DE	DEA2	Köln	26,981	400,505	296,610	6.74	135.03
DE	DEA3	Münster	28,678	535,715	398,580	5.35	134.41
DE	DEA4	Detmold	32,602	451,379	332,560	7.22	135.73
DE	DEA5	Arnsberg	53,830	351,110	254,110	15.33	138.17
DE	DEB	Rheinland-Pfalz	185,148	1,008,886	716,860	18.35	140.74
DE	DEB1	Koblenz	65,244	380,721	261,760	17.14	145.45
DE	DEB2	Trier	87,920	264,319	182,010	33.26	145.22
DE	DEB3	Rheinhessen-Pfalz	31,984	363,846	273,090	8.79	133.23
DE	DEC	Saarland	36,162	127,209	76,540	28.43	166.20
DE	DEC0	Saarland	36,162	127,209	76,540	28.43	166.20
DE	DED	Sachsen	59,311	1,116,889	917,200	5.31	121.77
DE	DED1	Chemnitz	16,720	357,627	286,640	4.68	124.77
DE	DED2	Dresden	29,116	447,800	364,330	6.50	122.91
DE	DED3	Leipzig	13,475	311,462	266,230	4.33	116.99
DE	DEE	Sachsen-Anhalt	118,514	1,423,282	1,172,920	8.33	121.35
DE	DEE1	Dessau	29,134	272,746	X	10.68	-
DE	DEE2	Halle	8,018	334,778	X	2.40	-
DE	DEE3	Magdeburg	81,362	815,758	X	9.97	-
DE	DEF	Schleswig-Holstein	134,582	1,243,986	990,720	10.82	125.56
DE	DEF0	Schleswig-Holstein	134,582	1,243,986	990,720	10.82	125.56
DE	DEG	Thüringen	71,498	963,023	793,710	7.42	121.33
DE	DEG0	Thüringen	71,498	963,023	793,710	7.42	121.33
DK	NUTS_0	Denmark	191,262	3,433,650	2,662,590	5.57	128.96
DK	DK01	Hovedstaden	8,247	142,010	98,570	5.81	144.07
DK	DK02	Sjælland	17,622	584,787	480,810	3.01	121.63
DK	DK03	Syddanmark	45,386	1,012,193	792,320	4.48	127.75
DK	DK04	Midtjylland	63,192	1,045,584	801,190	6.04	130.50
DK	DK05	Nordjylland	56,815	649,076	489,700	8.75	132.55
EE	NUTS_0	Estonia	531,554	1,605,575	906,830	33.11	177.05
ES	NUTS_0	Spain	18,820,501	33,698,696	24,834,240	55.85	135.69
ES	ES11	Galicia	770,573	1,624,435	748,660	47.44	216.98
ES	ES12	Principado de Asturias	523,953	572,941	385,060	91.45	148.79
ES	ES13	Cantabria	250,476	291,223	285,730	86.01	101.92
ES	ES21	Pais Vasco	204,473	297,673	242,780	68.69	122.61
ES	ES22	Comunidad Foral de Navarra	307,017	638,076	588,350	48.12	108.45
ES	ES23	La Rioja	112,270	296,228	244,760	37.90	121.03
ES	ES24	Aragón	1,627,164	3,239,453	2,398,270	50.23	135.07
ES	ES30	Comunidad de Madrid	348,515	513,365	343,190	67.89	149.59
ES	ES41	Castilla y León	3,708,355	6,629,401	5,471,310	55.94	121.17
ES	ES42	Castilla-la Mancha	2,789,900	5,886,435	4,468,990	47.40	131.72
ES	ES43	Extremadura	2,901,559	3,400,719	2,700,730	85.32	125.92
ES	ES51	Catalunya	946,447	1,693,319	1,166,540	55.89	145.16
ES	ES52	Comunidad Valenciana	906,910	1,606,479	686,570	56.45	233.99
ES	ES53	Illes Balears	219,163	331,722	194,260	66.07	170.76
ES	ES61	Andalucia	2,906,604	5,863,943	4,508,820	49.57	130.05
ES	ES62	Región de Murcia	296,475	812,264	400,220	36.50	202.95
ES	ES63	Ciudad Autónoma de Ceuta (ES)	536	536	-	100.00	-

NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
ES	ES64	Ciudad Autónoma de Melilla (ES)	111	484	-	22.93	-
FI	NUTS_0	Finland	1,268,980	2,992,428	2,292,280	42.41	130.54
FI	FI13	Itä-Suomi	302,002	450,288	339,500	67.07	132.63
FI	FI18	Etelä-Suomi	348,542	1,058,483	813,740	32.93	130.08
FI	FI19	Länsi-Suomi	396,733	1,015,844	793,230	39.05	128.06
FI	FI1A	Pohjois-Suomi	203,441	441,127	325,880	46.12	135.36
FI	FI20	Åland	18,262	26,686	19,930	68.43	133.90
FR	NUTS_0	France	8,023,118	35,204,602	27,355,830	22.79	128.69
FR	FR10	Île de France	4,275	658,690	562,470	0.65	117.11
FR	FR21	Champagne-Ardenne	220,138	1,765,068	1,569,030	12.47	112.49
FR	FR22	Picardie	31,182	1,486,821	1,318,030	2.10	112.81
FR	FR23	Haute-Normandie	25,028	910,402	787,990	2.75	115.53
FR	FR24	Centre	148,052	2,895,508	2,296,180	5.11	126.10
FR	FR25	Basse-Normandie	128,764	1,548,631	1,224,990	8.31	126.42
FR	FR26	Bourgogne	276,856	2,079,468	1,758,210	13.31	118.27
FR	FR30	Nord - Pas-de-Calais	23,720	978,695	818,700	2.42	119.54
FR	FR41	Lorraine	141,872	1,328,758	1,128,060	10.68	117.79
FR	FR42	Alsace	49,028	408,589	332,540	12.00	122.87
FR	FR43	Franche-Comté	333,501	821,158	663,440	40.61	123.77
FR	FR51	Pays de la Loire	237,375	2,743,913	2,174,460	8.65	126.19
FR	FR52	Bretagne	97,954	2,243,542	1,658,100	4.37	135.31
FR	FR53	Poitou-Charentes	158,504	2,094,230	1,722,340	7.57	121.59
FR	FR61	Aquitaine	349,822	2,079,198	1,411,170	16.82	147.34
FR	FR62	Midi-Pyrénées	1,199,642	3,018,815	2,343,860	39.74	128.80
FR	FR63	Limousin	441,174	1,054,902	856,230	41.82	123.20
FR	FR71	Rhône-Alpes	1,246,888	2,170,529	1,482,890	57.45	146.37
FR	FR72	Auvergne	995,955	1,762,636	1,499,120	56.50	117.58
FR	FR81	Languedoc-Roussillon	777,544	1,478,120	942,970	52.60	156.75
FR	FR82	Provence-Alpes-Côte d'Azur	797,259	1,283,688	656,020	62.11	195.68
FR	FR83	Corse	338,585	393,241	149,030	86.10	263.87
HR	NUTS_0	Croatia	2,955,012	3,285,969	978,670	89.93	335,76
HR	HR01	Northwest Croatia (Sjeverozapadna Hrvatska)	518,113	548,596	226,110	94.44	242,62
HR	HR02	Central and Eastern (Pannonian) Croatia (Sredisnja i Istocna (Panonska)	1,133, 953	1,425,045	637,840	79.57	223,42
HR	HR03	Adriatic Croatia (Jadranska Hrvatska)	1,302,946	1,312,328	114,720	99.29	1143.94
HU	NUTS_0	Hungary	1,935,454	6,768,833	4,228,580	28.59	160.07
HU	HU10	Közép-Magyarország	118,913	415,248	303,010	28.64	137.04
HU	HU21	Közép-Dunántúl	199,401	759,377	491,960	26.26	154.36
HU	HU22	Nyugat-Dunántúl	186,140	751,431	472,210	24.77	159.13
HU	HU23	Dél-Dunántúl	185,124	979,290	623,570	18.90	157.05

NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
HU	HU31	Észak-Magyarország	363,188	841,518	433,590	43.16	194.08
HU	HU32	Észak-Alföld	469,132	1,465,339	946,620	32.02	154.80
HU	HU33	Dél-Alföld	413,556	1,556,630	957,620	26.57	162.55
IE	NUTS_0	Ireland	1,154,495	5,729,074	4,139,240	20.15	138.41
IE	IE01	Border, Midlands and Western	715,167	2,635,001	1,819,440	27.14	144.82
IE	IE02	Southern and Eastern	439,328	3,094,073	2,319,800	14.20	133.38
IS	NUTS_0	Iceland	6,155,976	6,156,311	120,000	99.99	5130.26
IT	NUTS_0	Italy	6,196,451	18,393,993	12,744,200	33.69	144.33
IT	ITC1	Piemonte	586,426	1,370,361	1,040,180	42.79	131.74
IT	ITC2	Valle d'Aosta/Vallée d'Aoste	92,588	94,933	67,880	97.53	139.85
IT	ITC3	Liguria	95,843	126,007	49,410	76.06	255.02
IT	ITC4	Lombardia	289,312	1,258,153	995,320	22.99	126.41
IT	ITD1	Provincia Autonoma Bolzano-Bozen	179,009	214,933	258,010	83.29	83.30
IT	ITD2	Provincia Autonoma Trento	108,536	137,976	141,130	78.66	97.77
IT	ITD3	Veneto	236,802	1,153,468	820,200	20.53	140.63
IT	ITD4	Friuli-Venezia Giulia	97,563	351,187	228,060	27.78	153.99
IT	ITD5	Emilia-Romagna	342,615	1,522,729	1,052,590	22.50	144.66
IT	ITE1	Toscana	288,506	1,100,904	806,430	26.21	136.52
IT	ITE2	Umbria	132,870	466,890	339,400	28.46	137.56
IT	ITE3	Marche	137,093	660,130	496,420	20.77	132.98
IT	ITE4	Lazio	279,228	1,039,057	674,010	26.87	154.16
IT	ITF1	Abruzzo	268,748	622,780	434,010	43.15	143.49
IT	ITF2	Molise	92,442	292,440	200,260	31.61	146.03
IT	ITF3	Campania	240,291	819,283	562,880	29.33	145.55
IT	ITF4	Puglia	275,405	1,678,431	1,197,380	16.41	140.18
IT	ITF5	Basilicata	201,367	630,002	542,260	31.96	116.18
IT	ITF6	Calabria	336,870	817,720	514,050	41.20	159.07
IT	ITG1	Sicilia	711,982	2,171,565	1,251,850	32.79	173.47
IT	ITG2	Sardegna	1,202,955	1,865,044	1,072,470	64.50	173.90
LI	NUTS_0	Liechtenstein	81	5,706	3,531	1.42	161.60
LT	NUTS_0	Lithuania	640,277	4,011,830	2,648,950	15.96	151.45
LU	NUTS_0	Luxembourg (Grand-Duché)	13,637	140,317	130,880	9.72	107.21
LV	NUTS_0	Latvia	569,534	2,848,613	1,773,840	19.99	160.59
ME	NUTS_0	Montenegro	465,414	469,682	516,470	99.09	90.94
MK	NUTS_0	Former Yugoslav Republic of Macedonia, the	196,688	1,158,067	1,077,000	16.98	107.53
MT	NUTS_0	Malta	1,034	15,666	10,330	6.60	151.66
NL	NUTS_0	Netherlands	390,551	2,570,614	1,914,320	15.19	134.28

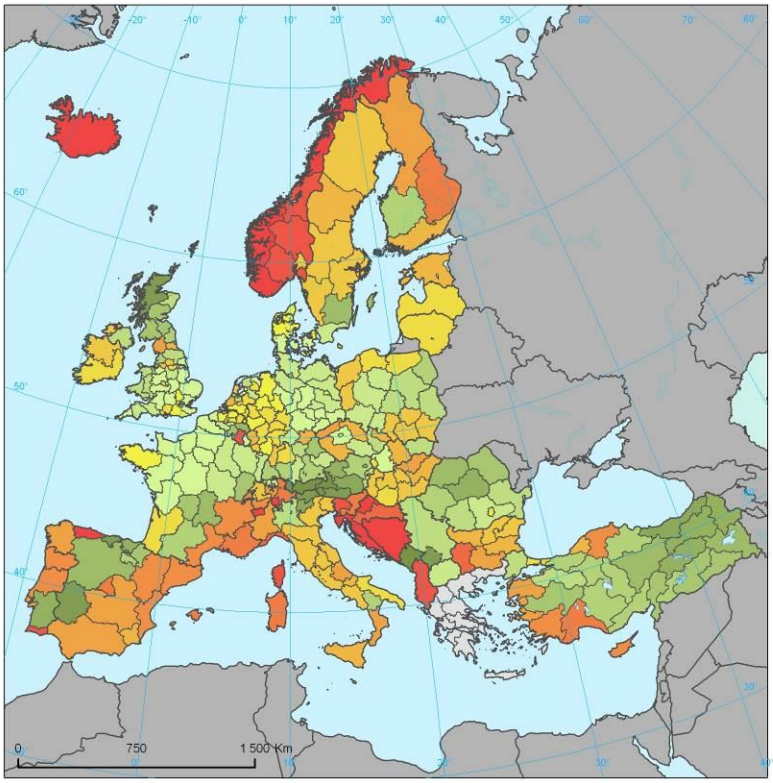
NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
NL	NL11	Groningen	16,175	206,332	162,180	7.84	127.22
NL	NL12	Friesland (NL)	84,156	299,680	234,180	28.08	127.97
NL	NL13	Drenthe	27,531	213,045	152,170	12.92	140.00
NL	NL21	Overijssel	44,535	269,979	209,660	16.50	128.77
NL	NL22	Gelderland	43,692	350,646	242,940	12.46	144.33
NL	NL23	Flevoland	6,113	108,482	90,820	5.64	119.45
NL	NL31	Utrecht	22,905	90,558	69,950	25.29	129.46
NL	NL32	Noord-Holland	49,539	190,127	132,160	26.06	143.86
NL	NL33	Zuid-Holland	61,122	195,914	140,880	31.20	139.06
NL	NL34	Zeeland	8,264	155,747	120,020	5.31	129.77
NL	NL41	Noord-Brabant	20,357	344,841	256,850	5.90	134.26
NL	NL42	Limburg (NL)	6,162	145,263	102,510	4.24	141.71
NO	NUTS_0	Norway	5,966,735	6,601,527	1,031,990	90.38	639.69
NO	NO01	Oslo og Akershus	24,352	113,616	79,620	21.43	142.70
NO	NO02	Hedmark og Oppland	602,941	736,669	212,190	81.85	347.17
NO	NO03	Sør-Østlandet	657,886	811,594	196,940	81.06	412.10
NO	NO04	Agder og Rogaland	826,110	883,182	132,180	93.54	668.17
NO	NO05	Vestlandet	1,170,706	1,224,682	147,940	95.59	827.82
NO	NO06	Trøndelag	929,107	1,037,262	165,910	89.57	625.20
NO	NO07	Nord-Norge	1,755,633	1,794,522	97,210	97.83	1846.03
PL	NUTS_0	Poland	4,488,811	19,750,026	15,477,190	22.73	127.61
PL	PL11	Lódzkie	273,531	1,292,260	1,075,090	21.17	120.20
PL	PL12	Mazowieckie	667,023	2,509,297	2,029,600	26.58	123.64
PL	PL21	Malopolskie	282,206	948,665	661,730	29.75	143.36
PL	PL22	Slaskie	175,953	630,403	404,260	27.91	155.94
PL	PL31	Lubelskie	455,643	1,794,690	1,530,840	25.39	117.24
PL	PL32	Podkarpackie	281,561	980,681	712,630	28.71	137.61
PL	PL33	Swietokrzyskie	186,438	750,317	558,980	24.85	134.23
PL	PL34	Podlaskie	462,784	1,314,730	1,093,270	35.20	120.26
PL	PL41	Wielkopolskie	345,963	2,035,638	1,746,110	17.00	116.58
PL	PL42	Zachodniopomorskie	290,772	1,246,818	916,010	23.32	136.11
PL	PL43	Lubuskie	156,384	613,763	457,290	25.48	134.22
PL	PL51	Dolnoslaskie	196,401	1,242,087	1,007,900	15.81	123.24
PL	PL52	Opolskie	78,758	611,388	552,730	12.88	110.61
PL	PL61	Kujawsko-Pomorskie	176,739	1,273,936	1,031,090	13.87	123.55
PL	PL62	Warminsko-Mazurskie	257,967	1,494,721	966,100	17.26	154.72
PL	PL63	Pomorskie	200,688	1,010,632	733,560	19.86	137.77
PT	NUTS_0	Portugal	2,854,853	4,881,341	3,357,030	58.49	145.41
PT	PT11	Norte	681,595	1,200,633	694,990	56.77	172.76
PT	PT15	Algarve	243,708	300,194	102,760	81.18	292.13
PT	PT16	Centro (PT)	651,972	1,243,204	584,290	52.44	212.77
PT	PT17	Lisboa	58,303	143,035	81,900	40.76	174.65
PT	PT18	Alentejo	1,219,275	1,994,275	1,893,090	61.14	105.34
RO	NUTS_0	Romania	5,221,251	14,401,453	13,753,050	36.26	104.71
RO	RO11	Nord-Vest	1,086,058	1,996,987	1,962,060	54.38	101.78
RO	RO12	Centru	1,214,719	1,771,018	1,762,930	68.59	100.46
RO	RO21	Nord-Est	859,764	2,069,560	2,087,970	41.54	99.12
RO	RO22	Sud-Est	488,483	2,429,493	2,187,990	20.11	111.04

NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
RO	RO31	Sud - Muntenia	389,277	2,448,526	2,255,530	15.90	108.56
RO	RO32	Bucuresti - Ilfov	8,241	114,192	187,700	7.22	60.84
RO	RO41	Sud-Vest Oltenia	490,014	1,804,171	1,629,490	27.16	110.72
RO	RO42	Vest	684,695	1,767,506	1,679,380	38.74	105.25
RS	NUTS_0	Serbia	1,003,818	4,867,569	5,053,000	20.62	96.33
SE	NUTS_0	Sweden	1,166,103	4,311,707	3,118,010	27.05	138.28
SE	SE01	Stockholm	42,974	145,974	97,470	29.44	149.76
SE	SE02	Östra Mellansverige	213,339	1,056,141	802,040	20.20	131.68
SE	SE04	Sydsverige	108,299	664,684	551,140	16.29	120.60
SE	SE06	Norra Mellansverige	91,228	376,602	266,950	24.22	141.08
SE	SE07	Mellersta Norrland	69,322	207,617	110,100	33.39	188.57
SE	SE08	Övre Norrland	76,298	348,858	111,050	21.87	314.14
SE	SE09	Småland med öarna	350,640	652,104	518,400	53.77	125.79
SE	SE0A	Västsverige	214,003	859,727	660,860	24.89	130.09
SI	NUTS_0	Slovenia	570,551	754,220	488,770	75.65	154.31
SI	SI01	Vzhodna Slovenija	360,484	518,586	340,010	69.51	152.52
SI	SI02	Zahodna Slovenija	210,067	235,634	148,760	89.15	158.40
SK	NUTS_0	Slovakia	479,205	2,413,272	1,936,620	19.86	124.61
SK	SK01	Bratislavský kraj	11,191	100,350	72,990	11.15	137.48
SK	SK02	Západné Slovensko	65,117	979,706	834,950	6.65	117.34
SK	SK03	Stredné Slovensko	233,483	635,655	480,710	36.73	132.23
SK	SK04	Východné Slovensko	169,414	697,561	547,970	24.29	127.30
TR	NUTS_0	Turkey	19,810,869	42,973,114	39,504,081	46.10	108.78
TR	TR10	Istanbul	24,501	156,524	100,654	15.65	155.51
TR	TR21	Tekirdag	328,135	1,336,760	1,154,499	24.55	115.79
TR	TR22	Balikesir	538,754	1,210,956	887,674	44.49	136.42
TR	TR31	Izmir	314,759	672,992	453,763	46.77	148.31
TR	TR32	Aydin	817,441	1,557,692	1,096,030	52.48	142.12
TR	TR33	Manisa	1,132,459	2,701,703	2,178,874	41.92	124.00
TR	TR41	Bursa	456,571	1,563,691	1,410,696	29.20	110.85
TR	TR42	Kocaeli	258,607	750,423	621,213	34.46	120.80
TR	TR51	Ankara	685,897	1,813,239	1,667,285	37.83	108.75
TR	TR52	Konya	1,187,044	3,305,005	3,420,373	35.92	96.63
TR	TR61	Antalya	855,185	1,386,717	923,031	61.67	150.24
TR	TR62	Adana	496,503	1,265,012	1,096,242	39.25	115.40
TR	TR63	Hatay	552,364	1,221,037	1,104,414	45.24	110.56
TR	TR71	Kirikkale	867,217	2,465,725	2,481,381	35.17	99.37
TR	TR72	Kayseri	2,030,702	3,883,760	3,845,312	52.29	101.00
TR	TR81	Zonguldak	131,924	372,675	201,866	35.40	184.61
TR	TR82	Kastamonu	581,121	1,147,079	842,020	50.66	136.23
TR	TR83	Samsun	740,012	1,999,436	1,904,803	37.01	104.97
TR	TR90	Trabzon	1,061,603	1,486,419	1,436,380	71.42	103.48
TR	TRA1	Erzurum	1,336,367	2,024,651	2,620,175	66.00	77.27
TR	TRA2	Agri	1,191,825	1,982,668	2,062,175	60.11	96.14
TR	TRB1	Malatya	1,085,566	1,704,070	1,688,710	63.70	100.91
TR	TRB2	Van	966,422	1,708,780	2,050,569	56.56	83.33
TR	TRC1	Gaziantep	392,036	1,144,761	919,034	34.25	124.56
TR	TRC2	Sanliurfa	1,221,457	2,937,267	2,318,446	41.58	126.69

NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
TR	TRC3	Mardin	556,397	1,174,072	1,018,463	47.39	115.28
UK	NUTS_0	United Kingdom	5,376,637	19,281,655	16,130,520	27.88	119.54
UK	UKC1	Tees Valley and Durham	79,141	252,258	181,510	31.37	138.98
UK	UKC2	Northumberland, Tyne and Wear	148,502	440,320	380,520	33.73	115.72
UK	UKD1	Cumbria	255,941	597,382	451,510	42.84	132.31
UK	UKD2	Cheshire	7,684	191,305	167,210	4.02	114.41
UK	UKD3	Greater Manchester	14,378	54,633	37,650	26.32	145.11
UK	UKD4	Lancashire	98,794	258,068	218,470	38.28	118.13
UK	UKD5	Merseyside	2,640	24,877	17,140	10.61	145.14
UK	UKE1	East Yorkshire and Northern Lincolnshire	4,832	315,463	269,610	1.53	117.01
UK	UKE2	North Yorkshire	220,090	761,000	608,270	28.92	125.11
UK	UKE3	South Yorkshire	17,132	106,600	78,470	16.07	135.85
UK	UKE4	West Yorkshire	33,138	134,144	95,860	24.70	139.94
UK	UKF1	Derbyshire and Nottinghamshire	42,459	385,804	321,130	11.01	120.14
UK	UKF2	Leicestershire, Rutland and Northants	2,483	419,112	368,920	0.59	113.61
UK	UKF3	Lincolnshire	5,931	551,706	491,680	1.08	112.21
UK	UKG1	Herefordshire, Worcestershire and Warks	5,240	519,120	435,030	1.01	119.33
UK	UKG2	Shropshire and Staffordshire	20,325	536,740	466,400	3.79	115.08
UK	UKG3	West Midlands	1,042	20,075	14,700	5.19	136.56
UK	UKH1	East Anglia	41,016	1,122,349	919,160	3.65	122.11
UK	UKH2	Bedfordshire, Hertfordshire	1,639	224,366	170,320	0.73	131.73
UK	UKH3	Essex	9,008	309,719	239,820	2.91	129.15
UK	UKI1	Inner London	179	179	210	100.00	85.24
UK	UKI2	Outer London	2,169	23,331	11,430	9.30	204.12
UK	UKJ1	Berkshire, Bucks and Oxfordshire	5,060	454,728	359,830	1.11	126.37
UK	UKJ2	Surrey, East and West Sussex	26,963	375,644	273,570	7.18	137.31
UK	UKJ3	Hampshire and Isle of Wight	32,318	310,523	218,230	10.41	142.29
UK	UKJ4	Kent	15,656	289,684	224,070	5.40	129.28
UK	UKK1	Gloucestershire, Wiltshire and Bristol/Bath area	43,207	624,535	530,810	6.92	117.66
UK	UKK2	Dorset and Somerset	53,848	535,628	467,470	10.05	114.58
UK	UKK3	Cornwall and Isles of Scilly	27,662	320,052	269,950	8.64	118.56
UK	UKK4	Devon	66,089	588,922	493,620	11.22	119.31
UK	UKL1	West Wales and The Valleys	302,072	1,076,291	861,380	28.07	124.95
UK	UKL2	East Wales	179,971	651,024	511,520	27.64	127.27
UK	UKM1	North Eastern Scotland	108,664	525,424	465,710	20.68	112.82
UK	UKM2	Eastern Scotland	667,365	1,411,896	1,297,730	47.27	108.80

NUT 0	NUTS1/2	Country/NUTS Code	HNV farmland area derived from the EU HNV map	Agricultural land (CLC agricultural classes + HNV areas)	UAA from EUROSTAT FSS	Area share of HNV farmland	Discrepancy (CLC agricultural classes + HNV areas) / UAA
UK	UKM3	South Western Scotland	362,885	900,079	774,750	40.32	116.18
UK	UKM4	Highlands and Islands	2,213,842	2,754,184	2,429,970	80.38	113.34
UK	UKN0	Northern Ireland	257,272	1,214,490	1,006,890	21.18	120.62
XK	NUTS_0	Kosovo (under United Nations Security Council Resolution 1244/99)	497,705	610,960	539,000	81.46	113.35

6.8 ANNEX - AREA SHARE OF HNV FARMLAND PER NUTS 2 ACCORDING TO DISCREPANCIES BETWEEN UAA AND CLC



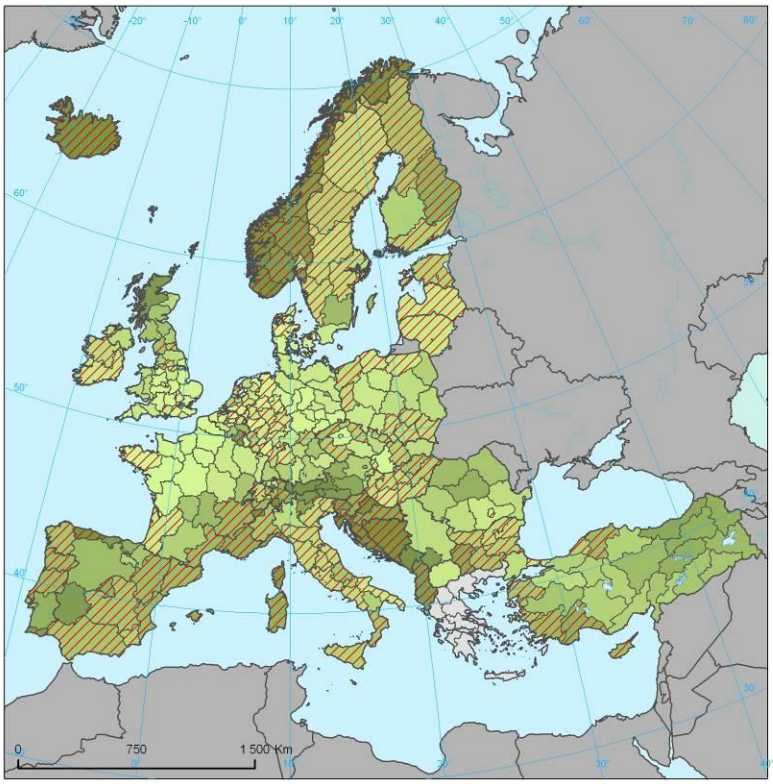
Area share of HNV farmland per NUTS2 according to discrepancy between CLC and UAA

NUTS2 with discrepancy > 70 or < 130
- 0 - 10%
- 11 - 20%
- 21 - 30%
- 31 - 40%
- 41 - 50%
- 51 - 60%
- 61 - 70%
- 71 - 80%
- 81 - 90%
- 91 - 100%

NUTS2 with discrepancy < 70 or > 130
- 0 - 10%
- 11 - 20%
- 21 - 30%
- 31 - 40%
- 41 - 50%
- 51 - 60%
- 61 - 70%
- 71 - 80%
- 81 - 90%
- 91 - 100%
- No data
- Area outside AOI
- NUTS regions borders (*)
- Country borders
- Kosovo under UNSCR 1244 borders

(*) NUTS 0: AL, BA, CY, EE , IS, LI, LT, LU, LV, ME, MK, MT, RS, XK
NUTS 2: AT, BE, BG, CH, CZ, DE, DK, ES, FI, FR, GR, HR, HU, IE, IT, NL, NO, PL, PT, RO, SE, SI, SK, TR, UK

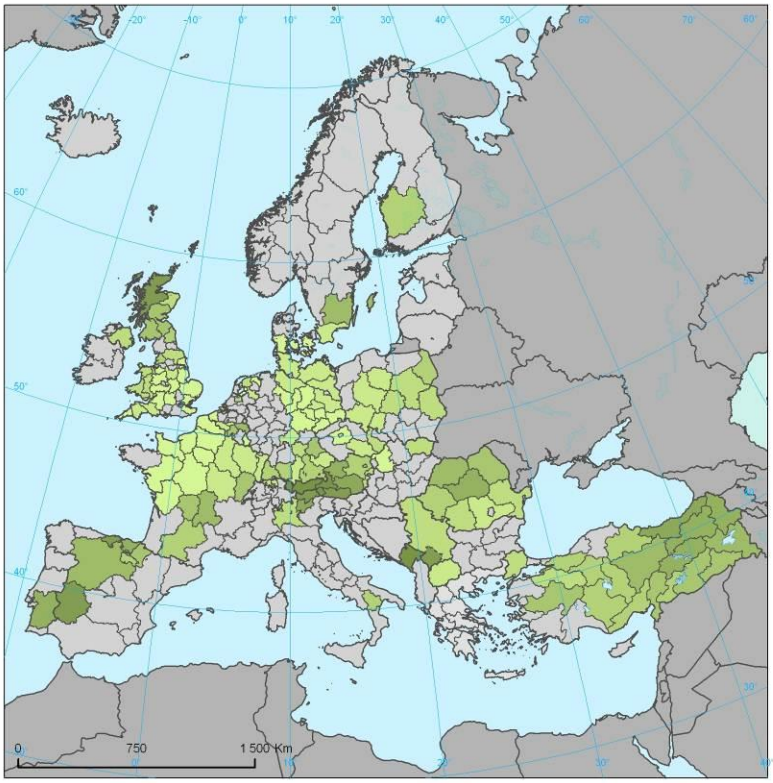
NUTS = Nomenclature of territorial units for statistics.



Area share of HNV farmland per NUTS2 according to discrepancy between CLC and UAA
- 0 - 10%
- 11 - 20%
- 21 - 30%
- 31 - 40%
- 41 - 50%
- 51 - 60%
- 61 - 70%
- 71 - 80%
- 81 - 90%
- 91 - 100%
- NUTS2 with discrepancy < 70 or > 130
- No data
- Area outside AOI
- NUTS regions borders (*)
- Country borders
- Kosovo under UNSCR 1244 borders

(*) NUTS 0: AL, BA, CY, EE , IS, LI, LT, LU, LV, ME, MK, MT, RS, XK
NUTS 2: AT, BE, BG, CH, CZ, DE, DK, ES, FI, FR, GR, HR, HU, IE, IT, NL, NO, PL, PT, RO, SE, SI, SK, TR, UK

NUTS = Nomenclature of territorial units for statistics.

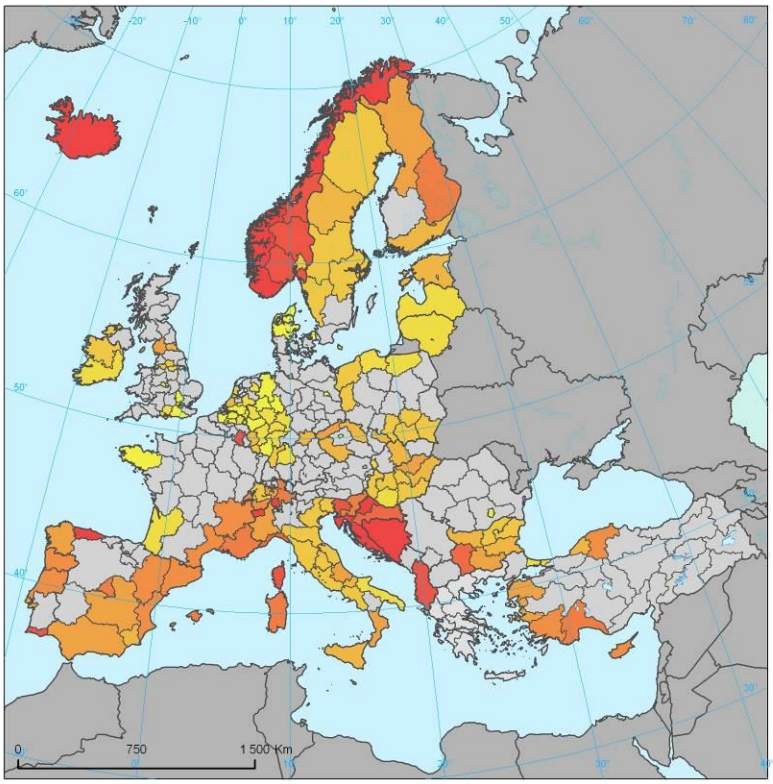


Area share of HNV farmland per NUTS2 according to discrepancy between CLC and UAA

NUTS2 with discrepancy > 70 or < 130
- 0 - 10%
- 11 - 20%
- 21 - 30%
- 31 - 40%
- 41 - 50%
- 51 - 60%
- 61 - 70%
- 71 - 80%
- 81 - 90%
- 91 - 100%
- NUTS2 with discrepancy < 70 or > 130
- No data
- Area outside AOI
- NUTS regions borders (*)
- Country borders
- Kosovo under UNSCR 1244 borders

(*) NUTS 0: AL, BA, CY, EE , IS, LI, LT, LU, LV, ME, MK, MT, RS, XK
NUTS 2: AT, BE, BG, CH, CZ, DE, DK, ES, FI, FR, GR, HR, HU, IE, IT, NL, NO, PL, PT, RO, SE, SI, SK, TR, UK

NUTS = Nomenclature of territorial units for statistics.



Area share of HNV farmland per NUTS2 according to discrepancy between CLC and UAA

NUTS2 with discrepancy < 70 or > 130
- 0 - 10%
- 11 - 20%
- 21 - 30%
- 31 - 40%
- 41 - 50%
- 51 - 60%
- 61 - 70%
- 71 - 80%
- 81 - 90%
- 91 - 100%
- NUTS2 with discrepancy > 70 or < 130
- No data
- Area outside AOI
- NUTS regions borders (*)
- Country borders
- Kosovo under UNSCR 1244 borders

(*) NUTS 0: AL, BA, CY, EE , IS, LI, LT, LU, LV, ME, MK, MT, RS, XK
NUTS 2: AT, BE, BG, CH, CZ, DE, DK, ES, FI, FR, GR, HR, HU, IE, IT, NL, NO, PL, PT, RO, SE, SI, SK, TR, UK

NUTS = Nomenclature of territorial units for statistics.

6.9 ANNEX - GIS METHODOLOGY TO DERIVE HNV 2006

Processing steps and naming conventions for the GIS calculation of HNV 2006