



European  
Commission



## **Farming for Natura 2000**

*Guidance on how to integrate Natura  
2000 conservation objectives into  
farming practices, based on Member  
States good practice experiences*

FINAL DRAFT

Environment

## **Farming for Natura 2000**

Guidance on how to integrate Natura 2000 conservation objectives into farming practices, based on Member States good practice experiences  
(FINAL DRAFT)

*This document reflects the views of the European Commission services and is of a non binding nature.*

European Commission 2013

Reproduction authorised provided the source is acknowledged. All photos are under copyright.

This document has been prepared for the European Commission by Concha Olmeda (Atecma/N2K GROUP), Clunie Keenleyside, Graham Tucker and Evelyn Underwood (IEEP) under contract N° 070307/2010/580710/SER/B3

### Acknowledgements:

Some N2K group members provided helpful comments and contributions, especially: Miroslava Plassmann, Oliviero Spinelli, Marc Thauront and Daniela Zaghi. Kerstin Sundseth revised the final draft and provided useful comment and suggestions. We also thank the following experts at IEEP for their contributions: Christina Ieronymidou, Marianne Kettunen, Ceri Margerison, Andrew McConville and Caitlin McCormack. Guy Beaufoy (European Forum on Nature Conservation and Pastoralism) provided advice and important inputs. An ad-hoc group with participants from different Member States and relevant stakeholders provided expert advice for the development of the guidance, particularly on the policy measures.

*Front cover: farming in Mala Fatra mountains, Slovakia, © istockphoto*

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	i-xiv
<b>PURPOSE OF THIS GUIDE</b> .....	1
▪ What is this guidance for? .....	1
▪ Who is this guidance for? .....	1
▪ What can you find in this document? .....	2
<b>1. INTRODUCTION</b> .....	4
1.1 Farming across the ages.....	4
1.2 Reforms of the Common Agricultural Policy.....	5
1.3 EU and Member States’ policy commitments on biodiversity .....	5
1.4 The Natura 2000 Network .....	7
1.5 A partnership between farmers and society .....	8
<b>2. FARMLAND IN NATURA 2000</b> .....	9
2.1 What kind of farmland is included in Natura 2000? .....	9
2.2 Which habitats and species of Community interest are concerned? .....	12
2.3 What is the current conservation status of habitats and species dependent on agriculture? .....	19
2.4 What are the main drivers of agricultural change that need to be addressed?.....	21
2.5 What are the main pressures and threats to habitats and species dependent on agriculture? ....	21
Further information .....	28
<b>3. AN OVERVIEW OF THE MANAGEMENT REQUIREMENTS FOR NATURA 2000</b> .....	29
3.1 How are Natura 2000 sites to be managed and protected?.....	29
3.2 implementing Article 6.1 on Natura 2000 farmland sites .....	33
3.3 Identifying the resources needed for managing Natura 2000 sites .....	39
Further information .....	41
<b>4. RECOMMENDATIONS FOR AGRICULTURAL MANAGEMENT OF NATURA 2000</b> .....	
<b>HABITATS AND SPECIES</b> .....	43
4.1 Habitat management .....	43
4.2 Species management .....	49
4.3 Key considerations for planning the management of Natura 2000 farmland.....	52
Further information .....	53
<b>5. THE CAP AND OTHER SOURCES OF FUNDING FOR NATURA 2000 FARMING SYSTEMS</b> .....	54
5.1 EU funding for Natura 2000 farmland .....	54
5.2 The importance of supporting the farming system not just the land management .....	56
5.3 Introduction to the reformed CAP as a key source of funding for Natura 2000 farmland from 2014 .....	57
5.4 The reference level for CAP payments and the eligibility of Natura 2000 farmland.....	60

5.5 CAP support to ensure economic viability of extensive Natura 2000 farming systems.....	66
5.6 CAP support for building the capacity of the Natura 2000 farms.....	70
5.7 CAP and other support for adding value to the produce of Natura 2000 farms .....	75
5.8 CAP support for the management of Natura 2000 farmland habitats and species .....	78
5.9 CAP payments for co-operation projects and local partnerships .....	86
5.10 Other EU funds for Natura 2000 .....	90
5.11 Market-based instruments and innovative instruments.....	92
Further information .....	94
<b>6. DESIGN AND IMPLEMENTATION OF MEASURES TO SUPPORT NATURA 2000 FARMLAND MANAGEMENT .....</b>	<b>96</b>
6.1 Strategic planning and prioritisation of conservation objectives and funding.....	96
6.2 Identifying Natura 2000 farmland and farming systems, and engaging with the farmers.....	99
6.4 Designing and targeting coherent packages of CAP support for Natura 2000 farms.....	104
6.5 Securing financial, technical, advisory and administrative resources for implementation.....	110
6.7 Monitoring, evaluation and review .....	112
<b>REFERENCES.....</b>	<b>114</b>
<b>ANNEXES .....</b>	<b>126</b>
ANNEX A - Key habitat types of Community interest that are dependent on agricultural management	
ANNEX B - Key species of Community interest associated with farmland	
ANNEX C - Main habitats of Community interest dependent on agriculture in each Member State	
ANNEX D - Management recommendations for each Annex I habitat type dependent on agricultural management	
ANNEX E - Case studies: Managing farmland in Natura 2000	

# EXECUTIVE SUMMARY

## The importance of farming for Natura 2000

Farming has been a major contributor to biodiversity, thanks to centuries of diverse farming traditions which has resulted in the development of an intricate patchwork of semi-natural habitats across the landscape. This has, in turn, attracted a wide range of species of fauna and flora.

The EU Member States have adopted two key pieces of EU legislation – the Habitats<sup>1</sup> and Birds<sup>2</sup> Directives – to conserve Europe’s most valuable species and habitats across their entire natural range within the EU. A central element of these Nature Directives is the creation of an EU-wide Natura 2000 Network of sites that must be managed and protected to ensure the conservation of the habitats and species of Community interest. But Natura 2000 sites are not strictly protected areas where all activities are systematically excluded. It adopts a different approach: one that fully recognises that humans are an integral part of nature and that the two work best in partnership with one another.

Many of the habitats and species that are protected under the Habitats and Birds Directives are dependent on, or associated with, agricultural practices<sup>3</sup>. These habitats and species are now dependent on locally tailored extensive farming systems and practices for their continued survival. Yet, in the last 50 years, through the combined effects of farm intensification and land abandonment, farmland biodiversity has undergone a dramatic decline.

The importance of farmers for the Natura 2000 network is reflected in the fact that farmland makes up around 40% of the total area included in Natura 2000. Because a high level of biodiversity usually coincides with low agricultural productivity, most of the farmland in Natura 2000 is located in the more marginal farming areas. Typical examples include alpine meadows and pastures, steppic plains, open heathland and wet grasslands.

Most of the low intensity farming systems that are included in Natura 2000 have usually developed over time, with farm structures and farming practices being closely adapted to local conditions. Broadly, they include:

- livestock systems where the forage areas are mainly semi-natural vegetation, including pastures, heath and scrub;
- low intensity arable systems (for example on poor soils, dry, saline or waterlogged areas, or in remote locations), often in rotation with semi-natural fallow vegetation;
- low intensity permanent crops, such as old traditionally managed orchards and olive groves; and

---

<sup>1</sup> Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Consolidated version 1. 1. 2007. [http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index\\_en.htm](http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm)

<sup>2</sup> Council Directive 2009/147/EC on the conservation of wild birds, codified version of Directive 79/409/EEC. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF>

<sup>3</sup> 255 species and 57 habitat types of Community interest are closely associated with agriculture.

- mixed farming systems with arable and/or permanent crops with livestock. Such farming systems also include farmland with a mosaic of low intensity agriculture and valuable landscape features, which can support a high species biodiversity.

A few Natura 2000 species are also found on intensively managed agricultural land. These include some internationally important wintering populations of geese and swans that graze intensive grassland and cereal crops in winter.

There is a considerable overlap between High Nature Value farmland areas and farmland in Natura 2000, as the farmed areas hosting habitats and species of Community interest are identified as HNV farmland.

In some of these areas, existing farming systems and practices are already compatible with the conservation of the species and habitats for which the site has been designated under Natura 2000, and the emphasis will be on finding ways to continue to support these farming practices and give due recognition to the farmers involved. In others, traditional farming practices may have been abandoned or converted to another form of farming that is less compatible to nature, in which case it will be necessary to find ways to re-introduce compatible farming systems or adjust existing practices so that they are able to contribute once again to the conservation of the habitats and species of Community interest for which the site has been designated.

This calls for a strong partnership approach between the farmers concerned, the public authorities responsible for both agricultural and nature policies and civil society at large. The present guide aims to illustrate how this partnership can be made to work effectively for the benefit of all. It provides an overview of the main issues to consider as regards the relationship between farming and Natura 2000 and offers a range of practical ideas, examples and recommendations on managing farmland in Natura 2000 sites, based on good practice experiences from across the EU.

### **The main drivers and pressures on Natura 2000 farmland**

Extensive livestock management has become unprofitable in many agricultural regions resulting in either abandonment or intensification in the absence of financial support (Beaufoy and Marsden, 2010).

Abandonment of extensive traditional farming practices is the most important pressure on key farmland habitats and species of Community interest. Agricultural abandonment is driven by a complex range of drivers that undermine the viability of farming under the current land use and socio-economic context in each area (Keenleyside & Tucker, 2010). Farming in these areas is challenged by a combination of social, economic, political and environmental factors, for example declining meat prices, labour and time constraints, poor access to markets, ageing rural populations, soil erosion, and constraints to productivity and mechanisation posed by geographical factors such as steep slopes or low soil fertility (IEEP & Veeneology, 2005; Keenleyside & Tucker, 2010). Projections of areas currently most at risk from abandonment identify mountainous and hilly areas (Keenleyside & Tucker, 2010).

By contrast, the second most important pressure on key farmland habitats and species is the intensification of management. Over the last hundred years and particularly since the 1950s, drivers of agricultural development (such as increasing commodity markets and prices, technological advances and market measures and support under the CAP) have led to widespread agricultural improvements and the intensification of management. This has led to significant changes in agricultural habitats, such that many of the natural and semi-natural elements that remained have been lost, resulting in highly modified and simplified agricultural systems. Many of the habitats are affected by a combination of abandonment in some areas and intensification in other areas.

### **Supporting the farming system**

Many Natura 2000 farming systems are under threat. Farmers who deliver the essential management of key habitats and species, often farm under difficult circumstances using labour-intensive systems on marginal land. They are extremely vulnerable to economic pressures to abandon their traditional farming systems and in some cases to cease production altogether.

It is therefore important to build an integrated package of support for Natura 2000 farmers that first ensures the economic viability of the extensive farming system on which the beneficial management depends, and secondly addresses the specific management practices needed for the conservation of the key habitats and species.

The first priority is to address the key threats of abandonment and intensification by ensuring that the farmer can continue (or resume) farming the land, and that the extensive farming system survives. The overall aim is to ensure the farming system is economically viable and support targeted at building the capacity of the farm infrastructure (and the farmer) and improving market income can help to achieve this aim.

When the underlying support for the farming system is in place then the support for the specific Natura 2000 habitat and species management practices will complete the package. This integrated package of support can be built up using a wide range of measures from both Pillars of the CAP, as explained below. Other EU instruments, such as LIFE and ERDF and other available private and public funds can also be used.

### **The management requirements for Natura 2000**

Member States have a clear responsibility under the Birds and Habitats Directives to ensure all habitats and species of Community interest are maintained or restored to Favourable Conservation Status. Natura 2000 sites have a crucial role to play in achieving this overall objective since they harbour the most important core sites for these species and habitats. Each site must therefore be managed in a way that ensures it contributes as effectively as possible to helping the species and habitats for which it has been designated reach a favourable conservation status within the EU.

Once a site has been included in the Natura 2000 Network, Member States are required to implement, on each site, the necessary conservation measures which correspond to the ecological requirements of the protected habitat types and species of Community interest

present, according to the Habitats Directive (article 6.1); they must also prevent any damaging activities that could significantly disturb those species and habitats (article 6.2) and to protect the site from new potentially damaging plans and projects likely to have a significant effect on a Natura 2000 site (article 6.3 and 6.4).

To ensure that each Natura 2000 contributes fully to reaching this overall target of FCS, it is important to set clear **conservation objectives** for each individual site. These should define the desired state, within that particular site, of each of the species and habitat types for which the site was designated.

Once the conservation objectives have been set, the necessary **conservation measures** that are required in order to fulfil these objectives and targets should be identified and negotiated with all involved so that they are effectively implemented. These must correspond to the ecological requirements of the habitats and species for which the site is designated.

A dialogue with all relevant stakeholders is needed to ensure that farmland management in Natura 2000 sites can contribute to the conservation of agricultural habitats and species. Farmers may have a very good understanding of previous land management that has led to conservation successes or failures.

Conservation measures can include both site-specific measures (ie management actions and/or management restrictions), and horizontal measures that apply to many Natura 2000 sites over a larger area (eg measures to reduce nitrate pollution or to regulate hunting or resource use). Appropriate instruments for implementing these conservation measures can include management plans specifically designed for the sites or integrated into other development plans, and/or appropriate statutory, administrative or contractual measures.

Agri-environmental agreements with farmers within the Rural Development Regulation are one example of a voluntary contractual measure aiming at maintaining a favourable conservation status of certain habitat types (eg. meadows, pastures) and species. The complexity of the necessary conservation measures may also require other kinds of contracts and agreements and other types of specific measures, including voluntary conservation management that does not involve any payment or incentive.

Horizontal measures can be suitable for certain habitat types/species across a whole region or country, or to tackle diffuse pressures such as eutrophication from agricultural run-off. In some situations, a few simple requirements that can be applied across the whole farmed landscape may be useful. Measures may also require no action (passive management). Furthermore, these measures may not necessarily be new, as existing measures can also contribute to achieving the conservation objectives.

On the other hand, more specific local approaches may be required in certain areas, including highly tailored and targeted measures that are best suited to the specific management needs of a particular species or habitat in a particular location. It is particularly important to understand the life cycle and ecological requirements of species when designing management measures for particular species. Local conditions can introduce some variation in the specific needs of habitats and species.

## Farming practices that can contribute to maintain or improve the conservation status of key farmland habitats and species

Low intensity agricultural management is necessary for the continued existence and conservation of key habitats and species linked to agricultural practices in Natura 2000 sites. Restoration actions may also be necessary prior to the re-introduction of suitable long-term management.

These management measures will mostly be implemented by farmers and adequate support should be provided to them. Some farmers are already carrying out good management measures and it is important to recognise and support their role in conserving and managing these habitats. Others will need support to reinstate management on abandoned land or to refrain from intensification of farmland.

Most of the agricultural habitats considered in this guidance are managed by **grazing**, which require defining suitable stocking rates, seasonality and timing, using adequate stock species or a combination of grazers when appropriate, and some form of rotational grazing in some cases. For many habitats, particularly in mountainous regions, **shepherding** is an important cultural tradition that needs to be maintained and supported.

**Mowing and hay cutting** is also an important farming activity for semi-natural grasslands (meadows), which requires considering the appropriate timing and frequency, using adequate equipment and machinery and taking into account whether removing or not the cut hay depending on the habitat type. In a number of habitats, grazing is used in combination with cutting.

As regards the **management of suitable areas for key farmland species** it is important to ensure that all feeding, breeding and shelter habitat requirements are provided across all seasons and within the species' home range area, which may require a mosaic of different habitat patches. Habitat patches must be sufficiently large to maintain viable populations, or sufficiently connected to support meta-populations. Farmland habitats such as hedges, dry stone walls, ponds and terraces are key habitats for species associated with extensive agriculture that should be maintained or restored.

In areas where farmland habitats are damaged by pressures from intensive agriculture, **restoration measures** may be needed to achieve favourable conservation status for key Natura 2000 habitats and species. Restoration actions may involve: reversing soil enrichment and re-introducing vegetation, reseedling to restore plant species diversity, controlling scrub, controlling invasive weeds and alien species and restoring hydrological management (eg by reversing drainage, restoring ground water levels and regimes, and flooding and river regulation).

Effective management of farmland habitats also needs to consider some crucial aspects. The **scale** at which conservation measures are implemented will affect their effectiveness. They must be targeted to a sufficiently large area to maintain or restore ecologically viable areas of suitable habitat or maintain minimum viable populations of species. The complex structure of some key habitats underpins their species richness. To maintain **habitat**

**diversity and heterogeneity**, management type and intensity must be varied and edge habitats maintained heterogeneity.

Management of farmland must be **locally adapted**. Agricultural measures must be tailored and targeted in order to be effective. The optimum regime can vary considerably between habitat sub-types and on a site-by-site basis, depending on factors such as soil, vegetation, altitude, climate, and management history. It is also important to consider site-specific management history, as habitats will often have adapted to and depend on the continuation of traditional regimes. Management planning should make use of both **expert conservation knowledge** and **local farming knowledge**.

**Conservation trade-offs** may be necessary, as different species will respond differently to management actions. Appropriate management strategies should either maximise the benefits to all species or favour sensitive or priority species, as defined by the conservation objectives.

### **EU funding for management of Natura 2000 farmland**

Opportunities for funding Natura 2000 have been included in each of the relevant EU funds for the 2014-20 financing period. In particular, the Common Agricultural Policy (CAP) has been and will continue being an important financial source.

In order to ensure a better use of the opportunities available for managing Natura 2000 sites under EU funds, the Commission has urged Member States to produce **prioritised action frameworks (PAFs)** for financing Natura 2000, which identify the strategic priorities and the measures to be carried out for the period 2014-2020 as well as the funding instruments that may be used to implement those measures

The Commission has also declared its intention to promote the use of innovative approaches and market-based instruments including private funding to support Natura 2000 management, although it recognises that these sources are likely to account for only a small proportion of the overall funding of the Natura 2000 network in the nearer future, and core public funding from the EU and Member States will continue to be required to deliver the conservation benefits of the network.

### **The reformed CAP as a key source of funding for Natura 2000 farmland from 2014**

The CAP represents one of the most important potential sources of EU funding for the management of farmland in Natura 2000 sites. The CAP operates on the basis of two main pillars. Pillar 1 provides income support to farmers, essentially in the form of direct payments whilst Pillar 2 offers a wide range of measures to support farmers and other land managers and rural communities through the multi-annual Rural Development Programmes (RDP) prepared by national or regional administrations.

The European Commission has published the draft legislative proposals for the reformed CAP after 2013. The proposed new regulations signify major changes in the status quo for many of the support measures relevant to Natura 2000 farming including Pillar 1 direct payments under the EAGF, Rural Development measures under the EAFRD (Pillar 2) as well as the cross compliance framework and requirements for monitoring and evaluation.

The focus of **Pillar 1** continues to be the provision of decoupled income support payments to farmers, but the structure and range of payments has changed considerably, with simplified requirements and improved access to direct payments for small farms and an option to provide additional payments for marginal farms and for farming systems of particular environmental importance.

A new '*green payment*' for agricultural practices beneficial to climate change and the environment is also proposed, which comprises three measures with which most farmers must comply: *crop diversification* (on farms with more than three hectares of arable land), *permanent grasslands* maintenance, and *Ecological Focus Areas* (7 per cent of the area of farmland eligible for the basic payment to be managed for ecological purposes, eg. as landscape features, fallow land, terraces and buffer strips).

Under **Pillar 2**, a wide range of measures are proposed which can be used to support Natura 2000 farmland. One of the new EAFRD focus areas will be "restoring and preserving biodiversity, including in Natura 2000 areas and high nature value farming, and the state of European landscapes". Relevant changes in relation to the current EAFRD include: broadening of the scope of the agri-environment measure by renaming it 'agri-environment-climate'; recognition of the benefits of collaborative action at the landscape scale, through higher transaction costs permitted within the payment calculation for management contracts involving more than one land manager; and extending the scope of the Natura 2000 compensation measure to cover farmland in other nature protection areas, with environmental restrictions which contribute to Article 10 of the Habitats Directive.

Member States can also create thematic sub-programmes within their RDPs, showing how they will use the measures available to contribute to the priorities set in the new regulation and to address specific needs in their national or regional contexts. The proposed regulation identifies the needs of young farmers, small farms, mountain areas and short supply chains as topics for thematic sub-programmes and allows Member States to raise the maximum rate of support for operations within these sub-programmes.

The two pillars of the CAP have different purposes but it is important that at farm level the **potential synergies** between them are used to support both Natura 2000 farming systems and management practices. It is important to consider the local conditions and to analyse which measures are best adapted to support the conservation objectives in each area.

It is also very important to **combine the different measures so as to ensure that sufficient support is provided** to extensive and High Nature Value farming systems. Pillar 1 payments are often needed alongside Pillar 2 agri-environment management payments if farming is to be maintained in areas with extensively managed semi-natural habitats (Oñate et al, 2007; Poláková et al, 2011).

All farmland in Natura 2000 should be eligible for CAP payments under both Pillar 1 and Pillar 2 but in a number of Member States substantial areas of Natura 2000 farmed habitat are currently deemed ineligible for direct payments under Pillar 1. This is the responsibility of the Member States, and eligibility issues are often related to characteristic features of Natura 2000 farmland which are an essential part of their biodiversity value, but do not fit within the Member State's interpretation of the EU eligibility rules. Issues include the

presence of trees, shrubs and scrub on pastureland, farm or parcel size, land tenure, outdated land registration records, and difficulties with GAEC standards that Member States have designed for more intensive farming systems.

### **CAP support to ensure economic viability of extensive Natura 2000 farming systems**

The first critical step in ensuring that farming continues in Natura 2000 areas is to make sure that the eligibility requirements for Pillar 1 payments are adapted to the particular characteristics of Natura 2000 farming systems. When eligibility of the land and the farmer has been assured there are several payments from both Pillars of the CAP which can be used, often in combination, to underpin the economic viability of these farms, including:

- Basic Payment Scheme and Small Farmers Scheme (Pillar 1)
- Proposed green payments (Pillar 1)
- Payments for areas with natural constraints (Pillar 1 and Pillar 2)
- Payments coupled to specific production systems (Pillar 1).

### **CAP support for building the capacity of the Natura 2000 farm**

Long-term economic and environmental viability of Natura 2000 farming systems depends on building the administrative and environmental capacity of the farmer and the economic capacity of the farm. Public support for capacity building comes from both Pillars of the CAP, but it is essential that this support is tailored to the specific needs of Natura 2000 farmers and farming systems in meeting the environmental objectives. The range of capacity building support includes:

- farm advisory services (Pillars 1 and 2)
- knowledge transfer and information (Pillar 2)
- Investment in physical assets (Pillar 2)
- farm and business development (Pillar 2)
- Income support and other payments for young farmers (Pillar 1 and Pillar 2)

The provision of advice, support and training for farmers is crucial for the survival of Natura 2000 farming systems and the successful management of key habitats and species. There is still a substantial unmet need for advice and support amongst farmers in the EU - in 2008 only around 5% of farmers receiving direct payments were given one-to-one advice (European Commission, 2010b). The proposed scope and requirements for the FAS from 2014 offers Member States an opportunity to provide very specific advisory services tailored to the environmental and economic needs of Natura 2000 farmers.

### **CAP and other support for adding value to the produce of Natura 2000 farms**

Many farmers on Natura 2000 and HNV grasslands face challenges selling their products, because they are often small producers in remote areas where there are few customers who can pay premium prices. On the other hand, some are well-placed to take advantage of direct marketing to eco-tourists and tourist services such as hotels and restaurants. In some regions Natura 2000 farmers have built up successful direct marketing connections to supermarkets. The range of support for farmers seeking to add value to their produce includes:

- Setting up producer groups (Pillar 2)
- Quality schemes for agricultural products (Pillar 2)
- Labeling and Protected Designation of Origin

### **CAP support for the management of Natura 2000 farmland habitats and species**

The management of Natura 2000 farmland addressing the particular needs of key habitats and species can be carried out using a range of support from Pillar 2 that includes:

- Preparing and updating Natura 2000 management plans
- Agri-environment-climate payments
- Non-productive investments linked to agri-environment and Natura 2000
- Natura 2000 compensation payments
- Animal welfare payments
- Prevention of damage to forests from forest fires and restoring agricultural production potential

Agri-environment measures are an especially important measure for Natura 2000. Under the current Rural Development Programme (2007-2013), several Member States have already successfully developed agri-environment schemes specifically tailored to the management of Natura 2000 sites or High Nature Value (HNV) farmland with Natura 2000 habitats and species. The new Pillar II should enable Member States and their regions develop further similar agri-environment schemes that are best suited to their own Natura 2000 farmland areas.

### **CAP payments for co-operation projects and local partnerships**

Local partnerships play a crucial role in implementing Natura 2000 conservation management on the ground. The EAFRD contains various possibilities to fund farmer action groups, or partnerships between farmer groups and other local organisations, for example local authorities or NGOs, including LEADER, producer groups, and co-operation projects. This range of support from Pillar 2 includes:

- Co-operation projects<sup>4</sup> to promote short supply chains and local markets, and facilitate collective approaches to environmental projects and environmental practices, from a local to a transnational level.
- Local partnerships LEADER

### **Other EU funds for Natura 2000**

**LIFE+** is the main EU funding instrument dedicated to the promotion of the environment within the EU. Although its budget is small compared to other EU financing instruments, LIFE+ has strategic importance for Natura 2000, because it finances very specific, targeted conservation measures which are more difficult to fund from other EU sources, such as monitoring and surveying, definition and establishment of management techniques, and management of risks to Natura 2000 sites (Gantioler et al, 2010; Kettunen et al, 2011).

---

<sup>4</sup> COM(2011) 627 final/3 Article 36

LIFE+ funding is particularly important for sites where agricultural management has been abandoned and Natura 2000 management planning has not progressed far enough to allow application for funding from other sources (Kettunen et al, 2011). Many Natura 2000 restoration projects have successfully combined LIFE funding with the development of agri-environment funding to ensure long-term financial support (WWF and IEEP, 2009).

The new LIFE Integrated Projects, included in the proposal for the LIFE fund for 2014-2020<sup>5</sup>, could also prove relevant for Natura 2000 habitat conservation by improving the integration of environmental aspects in other EU policies, and by focusing on the implementation of plans and strategies on a larger territorial scale (e.g. regional, multi-regional, national). Integrated projects should also contribute to mobilise other funding sources to achieve conservation objectives and implement the measures required in Natura 2000 areas.

The European Structural Funds can provide significant funding for Natura 2000 restoration, conservation, management and monitoring actions (European Commission, 2011b). The funding could also be used to support eco-tourism, awareness-raising and communication, training and education activities in Natura 2000 areas. The **European Regional Development Fund (ERDF)** allows for allocation of funds to biodiversity in the measures for promotion of biodiversity and nature protection (code 51), promotion of natural assets, and protection and development of natural heritage (Articles 4(4), 4(6), 5(2)b), 6(2)b)). The funds also allow for allocation of funding to transnational, cross-border and interregional cooperation which can benefit Natura 2000 sites and species, for example projects to develop eco-tourism, and to protect, restore and manage river basins, coastal zones, marine resources, water services and wetlands (Article 6(2)b). An example of the use of this fund is the planning and management of traditional rural landscapes in the Interreg Natureship project (Finland, Sweden, Estonia and Latvia) of Central Baltic Interreg IVA Programme.

The **European Social Fund (ESF)** can support capacity building aimed at the creation of new job opportunities related to Natura 2000, however it does not provide any dedicated objectives directly relevant for biodiversity so it is not possible to track the impacts of expenditure on Natura 2000 (Kettunen et al, 2011).

### Market-based instruments and innovative instruments

A range of other potential instruments exist through which public funding and/or policy actions can potentially stimulate increased private sector funding of biodiversity, often in combination with public funding, for example from not-for profit organisations (e.g. NGOs, foundations), philanthropic donations by companies, or from rural communities.

There is a key potential for micro-finance for pro-biodiversity local businesses and co-operatives, such as **direct marketing initiatives**. The added value offered by visitors and tourists in Natura 2000 areas could also be captured more effectively through integrated local development and conservation projects.

**Payments for Ecosystem Services** schemes can also provide an incentive for the conservation and restoration of biodiversity and habitats in order to safeguard (or

---

<sup>5</sup> European Commission (2011) Proposal for a regulation of the European Parliament and of the Council on the establishment of a Programme for the Environment and Climate Action (LIFE). COM(2011) 874 final.

potentially increase) the provision of the ecosystem services it provides. Typical ecosystem services that PES schemes are designed to support are groundwater quality, river water quality (restricting nutrient run-off and soil erosion), and carbon sequestration. PES schemes can operate between land managers or farmers and public organisations (such as municipal water companies) or private businesses (such as breweries), and may operate at the local, regional, river catchment or national scale. For example, the Sustainable Management Catchment Programme (SCaMP)<sup>6</sup>, developed by a UK water company in association with the RSPB, applies a Payment for Ecosystem Services scheme to the maintenance of grazing on upland heathland. The water company benefits from improved water quality by reducing erosion of the peat soils from burning and over-grazing (see this case study in Annex E for further details).

There are now voluntary and regulated **carbon trading schemes** operational throughout Europe that mean stored carbon, if verified, could have an economic and tradeable value (Worrall et al, 2009). This means that new income streams could become available for land management. The legal protection of carbon-rich habitats may also be strengthened in the near future as EU Member States start accounting for emissions/removals from land use, land use change and forestry (LULUF) in their national carbon budgets (eg in proposed CAP cross-compliance standard). Fens and heaths on intact peat soils could benefit from funding from carbon offsetting.

### **Design and implementation of measures to support Natura 2000 farmland management**

This document aims to guide in the process of planning, funding and implementing support for farming systems and communities on which the conservation of key Natura 2000 species and habitats depends. The focus is on the key source of funding Pillars 1 and 2 of the CAP with recommendations for each stage of the process. The main steps and relevant recommendations for the management of farmland in Natura 2000 are summarised below.

► **Strategic planning** is crucial to establish conservation priorities and funding needs for Natura 2000 farmland before the start of the 2014-20 programming period. This requires setting clear strategic objectives and priorities for conservation of key habitats and species that depend on Natura 2000 farmland. The prioritized action framework (PAF) should be used as the basis for integrating Natura 2000 financing priorities into EAFRD and other funding programmes. Then, it will be necessary to take timely action to ensure that Natura 2000 objectives and funding needs for 2014-20 from EAFRD and the Cohesion Funds are embedded in the legally binding Partnership Agreement between the Member State and the European Commission. It is essential to ensure cooperation between nature and agriculture authorities and relevant stakeholders in strategic planning for Natura 2000.

► **Identifying Natura 2000 farmland and farming systems, and engaging with the farmers** are important steps in the process. This requires assessing the current situation of Natura 2000 farmland, the economic viability of the Natura 2000 farming systems and the key pressures and drivers of change in land management or land use. It is important to engage the farmers and local communities in this information gathering process and develop a

---

<sup>6</sup> <http://www.unitedutilities.com/scamp.aspx>

partnership approach that involves them fully in the process of designing, delivering and monitoring support measures for their farming systems and the rural economy.

► **Ensuring eligibility for CAP support and setting the reference level**, through joint working and close co-operation between the environmental agricultural authorities. It is crucial to ensure that the Natura 2000 farmland identified is classed as part of the UAA and is recorded in the LPIS/IACS systems.

Using the flexibility available to agricultural managing authorities in the CAP regulations, it is necessary to ensure that Natura 2000 farmers using this land are eligible for both Pillar 1 and Pillar 2 CAP support. If necessary, GAEC standards and other CAP eligibility rules may be specifically defined for HNV and/or Natura 2000 farmland. It is also important to ensure there is a clear distinction, readily understood by farmers, between a) legal obligations placed on farmers by national or regional legislation linked to Natura 2000 implementation; b) other national or regional legislation; and c) SMR and GAEC cross-compliance requirements.

► **Designing and targeting coherent packages of CAP support for Natura 2000 farms** requires adopting an inclusive partnership approach, fully involving the target farmers and making use of their expert knowledge of farm and habitat management. Coherent, integrated packages of support from both Pillars of the CAP can be designed to address the specific needs of Natura 2000 farming systems and the key habitats and species that depend on agricultural management. Income support payments of several types will be available from Pillar 1, and the proposed new structure of the EAFRD makes it very much easier to design coherent packages of RDP support for the 2014-20 programming period

Extensive farming systems that provide Natura 2000 habitats need to be economically and socially viable, and this depends on farms receiving an adequate and reliable baseline of CAP income support payments and support for capacity building, as well as payments that can address the specific management needs of certain habitat and species.

The design process should take a holistic view of the needs of these farms to build up a coherent package of support which aims first to secure the farming system and its economic viability, then to provide incentives for the very detailed habitat and species management. The range of potential measures to meet these needs is illustrated in the table below, and each of these measures is described in detail in this guide, which also provides relevant practical examples from different EU countries.

The choice of measures is quite wide and will depend on the strategic objectives, the characteristics of the Natura 2000 farming systems, the threats they face and the opportunities available within the rural economy.

Cost-effective use of available funding shall be made by designing and targeting support as closely as possible to farm and habitat requirements, at the appropriate spatial scale.

It is essential to ensure that small farmers are able to access easily the appropriate support from both Pillars of the CAP. Opportunities to use group and co-operative approaches must be considered, especially where multiple small farms are involved and to encourage 'bottom up' delivery through LEADER.

It is also important to ensure that payment rates for Areas with Natural Constraints (ANC), Natura 2000 and agri-environment-climate measures reflect the full cost of management, especially where there is little or no income to forgo, and use the option for adding transaction costs to these calculations, where available.

The new thematic RDP sub-programme options for mountain farms and small farms could be used to devise specific Natura 2000 options, with higher rates of support.

**Potential CAP support measures for Natura 2000 farming systems and management**  
(measures shown in bold are compulsory for Member States)

Objective	Pillar 1	Pillar2
<i>Ensure that farming continues</i>	<b>Basic Payment Scheme</b> <b>Green payment</b> <b>Small Farmers Scheme</b>	
<i>Support extensive farming systems</i>	ANC payment Coupled payments (c.f. Art.68)	ANC compensation payment Organic farming
<i>Build capacity and add value</i>	<b>Young Farmers Scheme</b>	Advisory services Knowledge transfer and information Investment in physical assets Farm and business development Setting up producer groups Quality schemes for agricultural products
<i>Specific conservation management of Natura 2000 habitats and species</i>		<b>Agri-environment-climate</b> Non-productive investments Natura 2000 compensation Animal welfare payments Prevention of forest fires and restoring agricultural potential

► **Securing financial, technical, advisory and administrative resources for implementation.** Sufficient financial and other resources should be available for long-term support, including trained advisory and paying agency staff with the technical expertise required for Natura 2000 land management.

Funding under RDPs needs to be on a long-term basis if at all possible, as gaps in funding erode confidence amongst farmers and landowners and dissuade them from taking on long-measures (such as habitat restoration). It is essential to secure funding not just for payments to farmers but also to cover all the delivery and support costs, for example advisory services, training and skills acquisition, preparation of Natura 2000 and HNV management plans, group facilitation and LEADER.

Advice and information should be delivered by sources trusted by the farmer and should always integrate advice on conservation with advice on how this can be accommodated within the farming system. Funding should also be made available for monitoring the impacts of management activities at farm level.

► **Monitoring, evaluation and review** are essential to assess the effectiveness and efficiency of measures in delivering their objectives, and to allow schemes and management practices to be adapted and refined over time. A suite of indicators specific to the CAP as a whole, and rural development policy in particular are established through the Common Monitoring and Evaluation Framework (CMEF). These must be applied in all RDPs, although Member States are also able to put in place additional indicators relevant to their national/regional situation.

Monitoring should allow assessing the uptake and coverage of the measures, any possible difficulties and constraints for their implementation, as well as their impact in relation to the pursued conservation objectives. It is important to design monitoring schemes that can also be applied at farm level using suitable indicators that can be easily verified. Involving farmers in regular monitoring of the results achieved through their implementation of the required measures has proved to be very effective and a ways to improve their participation in the implementation of the schemes. Wider public communication is also very important to create a positive image of the target species and habitats, and recognise those who make efforts to protect them.

Where Natura 2000 management schemes are being introduced for the first time, small-scale pilot testing and evaluation can improve the efficiency, acceptance and delivery of the schemes.

### Final remarks

Farmers who contribute to suitable management of key habitats and species dependent on agricultural practice often farm under difficult circumstances and are extremely vulnerable to economic pressures, which can lead them to abandon their traditional farming systems.

Funding opportunities exist to support the whole farm economic viability and to promote the implementation of the measures needed for the conservation of agricultural habitats and species of Community interest and for the management of the Natura 2000 sites.

Member States can make best use of these opportunities to build integrated packages of support for Natura 2000 farmers that ensure the economic viability of the extensive farming system on which the beneficial management depends, and also address the specific management practices needed for the conservation of the key habitats and species.

The revised CAP for the period 2014-2020 provides a new opportunity for Member States to develop coherent packages of support specifically for Natura 2000 farmers. These should combine measures from both Pillars of the CAP with the aim of supporting the continuation of the extensive farming systems, helping farmers to add value to the produce and rewarding them for the management of Natura 2000 sites, habitats and species.

## PURPOSE OF THIS GUIDE

- **What is this guidance for?**

This guidance document has been prepared to assist Member State administrations and key stakeholder groups, who are responsible for agriculture and nature conservation, in developing and promoting farming systems and practices within Natura 2000 areas that will help maintain and improve the conservation status of rare and threatened habitats and species of EU importance.

The guidelines have been prepared through an active dialogue with relevant stakeholders (agricultural and environmental authorities, farmers' organisations, environmental NGOs..) in order to find ways to encourage a more integrated approach to the management of farmland in Natura 2000 areas, and to strengthen in particular the partnership approach.

The guide provides an overview of the main issues to consider as regards the relationship between farming and Natura 2000 and offers a range of practical ideas, examples and recommendations on managing farmland in Natura 2000 sites, based on good practice experiences from across the EU.

Different approaches are presented as regards the design, coordination and implementation of appropriate measures for maintaining habitats and species of EU interest through various types of farming systems and agricultural practices. Particular attention is given in this respect to the integration of Natura 2000 management measures into the Rural Development Programmes.

The document is intended to provide a useful source of advice and ideas for Member States and stakeholders. As such it reflects only the views of the European Commission and is not of a legally binding nature. The Habitats and Birds Directives are enshrined in the principle of subsidiarity and it is for Member States to determine the measures to be taken to manage their Natura 2000 sites in accordance with Article 6.1 and 6.2 of the Habitats Directive.

The present guidance is therefore not prescriptive in its intent, but rather aims to offer a useful source of information and advice to help Member States implement their obligations under the Habitats and Birds Directives.

- **Who is this guidance for?**

This guidance is primarily addressed to administrations dealing with the Common Agricultural Policy (CAP) (especially those designing Rural Development Programmes [RDPS] and supporting their implementation) and with the implementation of the Habitats and Birds Directives.

Conservation authorities and Natura 2000 managers will find relevant information and guidance on the management of key farmland habitats and species and on the use of the main instruments available to support their conservation, inter alia, under the RDP.

Agriculture authorities and RDP managers will find a clear overview of the obligations arising from EU Habitats and Birds Directives and their relevance/ importance for the agricultural sector. They will also find a wealth of practical advice and ideas on how to develop and promote appropriate farming measures and programmes that contribute to the conservation of Natura 2000 sites under a range of social, economic and physical or geographical conditions.

In addition, the guidance should be useful for farming organisations and land managers that are involved in the practical management of farmland in Natura 2000 areas.

- **What can you find in this document?**

*Chapter 1:* sets the overall policy context and provides a brief introduction to the Natura 2000 network and the EU's political commitments to stem the loss of biodiversity in Europe.

*Chapter 2:* explains the importance of farming for habitats and species of EU importance, identifies which Natura 2000 habitats and species are linked to specific farming systems and practices, and how agricultural management influences their conservation. It also gives an overview of the main pressures and threats to these habitats and species.

*Chapter 3* provides an overview of the management requirements for Natura 2000 sites in the context of farmland. It explains key terms such as setting conservation objectives, establishing conservation measures, and achieving a 'favourable conservation status' (FCS). It also outlines the different funding options available for Natura 2000 sites in farmland.

*Chapter 4* describes the main farming systems and practices that are needed to restore and maintain Natura 2000 farmland habitats and species in favourable conservation status.

*Chapter 5* describes the range of policy instruments and funds that can be used to maintain and re-introduce appropriate farming systems and practices within Natura 2000. This chapter also reviews the potential for market-based approaches to support Natura 2000 management.

*Chapter 6* provides a step by step guide to designing different types of packages of CAP measures to support the management of Natura 2000 in farmland. Real life examples from across the EU-27 countries are included to illustrate how the recommendations can and have been put in practice.

Annexes:

*Annex A:* describes the key habitat types of Community interest that are dependent on agriculture and the degree of dependency for each, as well as their distribution, total extent, proportion of habitat within Natura 2000, and their current conservation status.

*Annex B:* lists the key species of Community interest that are associated with farmland habitats. It identifies their habitat use within an agricultural context, their priority status, and their current conservation status.

*Annex C:* shows the area of farmland habitats of Community importance in those Member States that contain 10% or more of the total area of a habitat within any given biogeographical region. The aim is to highlight to Member States the habitats for which they have a particular responsibility.

*Annex D:* shows examples of recommendations for the management of each key Annex I habitat type associated with agriculture. Recommendations are *not* prescriptive and management should be adapted to national and local conditions and objectives, using the best available local knowledge.

*Annex E:* presents a series of 27 case studies on different approaches that have been used to manage farmland in a way that promotes the conservation of habitats and species of Community interest in different Member States.

# 1. INTRODUCTION

## 1.1 Farming across the ages

Europe's diverse farming practices have had a profound influence on our countryside, creating an intricate patchwork of semi-natural habitats that are so characteristic of today's landscape. They are part of what makes Europe's countryside special, both culturally and from a biodiversity perspective. Today, around half the EU's territory is agricultural land, and farming remains the principal economic activity in most rural areas. It keeps the countryside alive and plays a vital role in supporting the local economy.

Agriculture has of course undergone major changes over the years. From the 1950s on, farmers were encouraged to intensify and modernize their farming practices wherever possible in order to increase their yields and improve efficiency. Monocultures were introduced, fields enlarged, livestock farms expanded and pesticides and fertilizers applied. As a result, a significant part of extensive farmland has disappeared or been converted in the last 60 years.

However, not all of the agricultural land could undergo this process of intensification and mechanization. In many parts of the EU, the local terrain does not allow for such intensive practices. The slopes may be too steep, the soil too poor, the area too remote etc. Also, the local farm structure and land distribution patterns make it difficult to introduce such major agricultural changes.

As a result, today, significant parts of the EU continue to be farmed in a more extensive way that is well adapted to the local conditions. This is usually in the hands of local small-scale farmers rather than large agri-businesses. But they are far from being in the minority. Small scale farmers and extensive farming businesses still represent a significant proportion of the 14 million farmers in the EU-27.

Although not as productive as the modern large scale farms, these farming systems are nevertheless a vital part of the socio-economic fabric of Europe's rural areas and, as such, have an essential role to play socially, economically and environmentally within the EU. They represent a substantial source of local employment and income, preventing rural depopulation and helping to keep rural communities alive. They are a vital source of food and produce for many remote rural areas. And they play a major role in maintaining Europe's rich and diverse biodiversity.

However, despite their socio-economic importance, the viability of extensively managed farming businesses has become increasingly precarious over the years. In many parts of the EU, farmers have been forced to abandon their land and go in search of alternative sources of income elsewhere, with devastating social and economic consequences for the rural areas concerned. Over recent decades substantial areas of the EU have been affected by agricultural abandonment. There are also reasonable expectations that farmland

abandonment in Europe, particularly of extensively grazed areas, will continue over the next decades.

Land abandonment is mitigated to some extent by the Common Agricultural Policy (CAP), which supports environmentally beneficial farming practices and rural communities in marginal/less productive farming areas, and also requires landowners to maintain agricultural land in 'good agricultural and environmental condition' in order to receive CAP payments.

## **1.2 Reforms of the Common Agricultural Policy**

It is essential that society gives due recognition to farmers who manage their land in a way that is compatible with, and supportive of, the natural environment. As illustrated above, they not only play a vital role in maintaining the socio-economic fabric and environmental quality of Europe's rural areas, but also provide a wide range of environmental public goods and services to society.

This important role should be properly reflected in, and supported by, appropriate policy commitments at all administrative levels. The Common Agricultural Policy (CAP) also has a central part to play in this respect. Over the years, successive reforms have increasingly acknowledged the importance of providing support and incentives to this important sector of the farming community – especially through the strengthening of Rural Development Measures under Pillar II. This aims, amongst others, to help farmers who are living and working under difficult agricultural conditions to remain economically viable and to continue to produce environmentally sustainable products that are in keeping with the natural environment.

Moreover, the decoupling of farm subsidies from production and the introduction of cross compliance rules under the CAP have provided an opportunity for farmers to respond more easily to market conditions, while observing baseline environmental standards.

This is not to say that the general trend towards intensification and increased specialisation and mechanisation will stop (especially in the newer Member States, where agricultural structures and systems continue to change in response to market forces) but in today's society there is also a strong political demand, especially when using public funds, to place greater emphasis on the fact that farmers are not just as producers of food but also as custodians of our countryside, providing a wide range of ecosystem goods and services for the benefit of society as a whole and safeguarding our natural environment.

In this respect, the central role of farmers who manage their land in a way that is environmentally sound and well adapted to local conditions must not be overlooked in the drive towards ever increasing farm efficiency and productivity.

## **1.3 EU and Member States' policy commitments on biodiversity**

Farming has been a major contributor to biodiversity, thanks to centuries of diverse farming traditions which has resulted in the development of an intricate patchwork of semi-natural habitats across the landscape. This has, in turn, attracted a wide range of species of fauna

and flora. Some are well known like the corncrake and white stork, but a myriad of other lesser known species, such as large blue butterfly and many orchid species have also made their home in these semi-natural habitats.

These species are now entirely dependent on locally tailored extensive farming systems and practices for their continued survival. Yet, in the last 50 years, through the combined effects of farm intensification and land abandonment, farmland biodiversity has undergone a dramatic decline. Today, only around 15-25% of Europe's once extensive farmland areas of high nature value remain. Farmland bird populations have also decreased by around 50% since the 1980s but have leveled off since, whereas farmland butterfly populations have decreased by 70% since 1990 and as yet show no sign of recovery (Van Swaay et al 2010).

Recognising this alarming decline in Europe's biodiversity, the EU Member States have adopted two key pieces of EU legislation – the Habitats<sup>7</sup> and Birds<sup>8</sup> Directives – to conserve Europe's most valuable species and habitats across their entire natural range within the EU. The overall objective of the Birds Directive is to maintain and restore the populations of all naturally occurring wild bird species present in the EU at a level that will ensure their long-term survival. The Habitats Directive has similar objectives to the Birds Directive but targets a number of species other than birds as well as certain habitat types in their own right.

The two directives do not cover every species of plant and animal in Europe (i.e. not all of the EU's biodiversity). Instead, they focus on a sub-set of around 2000 (out of ca 100,000 or more species present in Europe) - which are so rare or endangered that they are in urgent need of protection to prevent their extinction. These are often referred to as species of Community interest or EU importance.

The two directives require that Member States do more than simply prevent the further deterioration of these species and habitat types of Community interest, they must also introduce measures to ensure that they reach a favourable conservation status throughout their natural range within the EU. The fact that a habitat or species is not threatened (i.e. not faced by any direct extinction risk) does not necessarily mean that it is in favourable conservation status.

These two EU nature Directives are the cornerstones of the EU's biodiversity policy. In 2012, the EU set itself the target of *halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them so far as feasible, whilst stepping up the EU's contribution to averting global biodiversity loss.*

This reflects the strong political commitment that European Heads of State and Governments' have made and puts biodiversity high on EU's political agenda. The EU's reinforced Biodiversity Strategy<sup>9</sup>, adopted in 2012, identifies six major target areas where action is required to address the main pressures on nature and ecosystem services in the

---

<sup>7</sup> Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Consolidated version 1. 1. 2007. [http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index\\_en.htm](http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm)

<sup>8</sup> Council Directive 2009/147/EC on the conservation of wild birds, codified version of Directive 79/409/EEC. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF>

<sup>9</sup> Full text of the EU Biodiversity Strategy available at: [http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/1\\_EN\\_ACT\\_part1\\_v7\[1\].pdf](http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/1_EN_ACT_part1_v7[1].pdf)

EU. One of the six targets is to increase the contribution of agriculture and forestry to biodiversity.

### **The EU biodiversity strategy to 2020**

The EU biodiversity strategy to 2020 aims to halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status. The strategy seeks to improve integration in key sectors, specifically through targets and action to enhance the positive contribution of the agriculture, forest and fisheries sectors to biodiversity conservation and sustainable use. With respect to agriculture, existing instruments under the CAP will contribute to this target. The strategy also aims to improve connectivity amongst Natura 2000 sites and in the wider environment through the development of green infrastructure

#### **Target 1**

To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status so that, by 2020, compared to current assessments: (i) 100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and (ii) 50% more species assessments under the Birds Directive show a secure or improved status.

#### **Target 2**

By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems.

#### **Target 3**

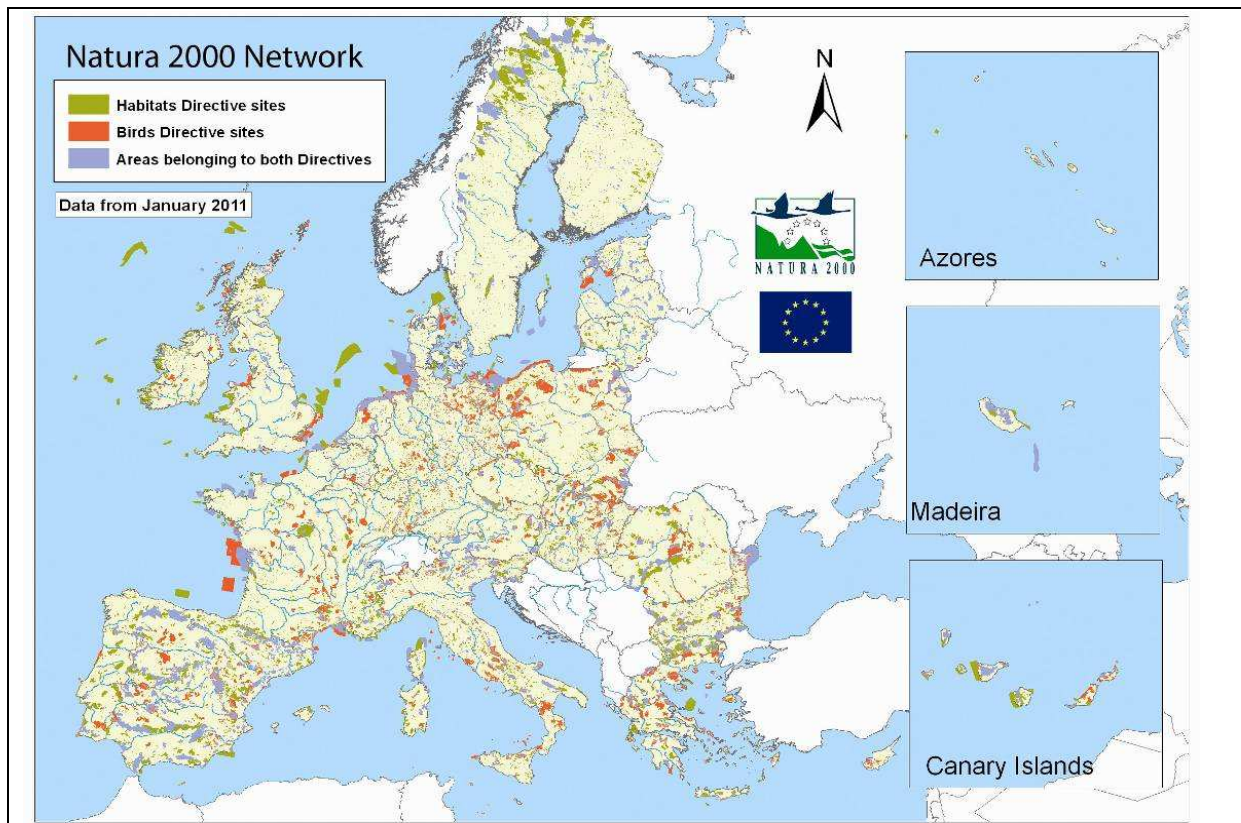
A) Agriculture: By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement in the conservation status of species 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 European Commission has also emphasised that the effective management and restoration of Natura 2000 protected areas is central to attainment of the EU 2020 biodiversity target.

### **1.4 The Natura 2000 Network**

A central element of the Nature Directives is the creation of an EU-wide Natura 2000 Network. It is comprised of Sites of Community Importance (SCIs) and Special Conservation Areas (SAC) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Birds Directive (referred to collectively as Natura 2000 sites). How these sites are to be managed and protected is explained further in chapter 3.

Over 26,000 sites have been included in the Natura 2000 Network so far. Together, they cover around 18% of the land area in the EU-27 as well as significant marine areas. But Natura 2000 is not a system of strict nature reserves, it adopts a different approach, one that fully recognises and man is an integral part of nature and the two work best in partnership with one another.



### 1.5 A partnership between farmers and society

The importance of farmers for the Natura 2000 network is reflected in the fact that farmland makes up around 40% of the total area included in Natura 2000. Because a high level of biodiversity usually coincides with low agricultural productivity, most of the farmland in Natura 2000 is located in the more marginal farming areas. Typical examples include alpine meadows and pastures, steppic plains, open heathland and wet grasslands.

In some of these areas, existing farming systems and practices are already likely to be compatible with the conservation of the species and habitats for which the site has been designated under Natura 2000, and the emphasis will be on finding ways to continue to support these farming practices and give due recognition to the farmers involved. In others, traditional farming practices may already have been abandoned or converted to another form of farming that is less compatible to nature, in which case it will be necessary to find ways to re-introduce compatible farming systems or adjust existing practices so that they are able to contribute once again to the conservation of the habitats and species of Community interest for which the site has been designated.

This calls for a strong partnership approach between the farmers concerned, the public authorities responsible for both agricultural and nature policies and civil society at large. The present guide aims to illustrate how this partnership can be made to work effectively for the benefit of all. It provides an overview of the main issues to consider as regards the relationship between farming and Natura 2000 and offers a range of practical ideas, examples and recommendations on managing farmland in Natura 2000 sites, based on good practice experiences from across the EU.

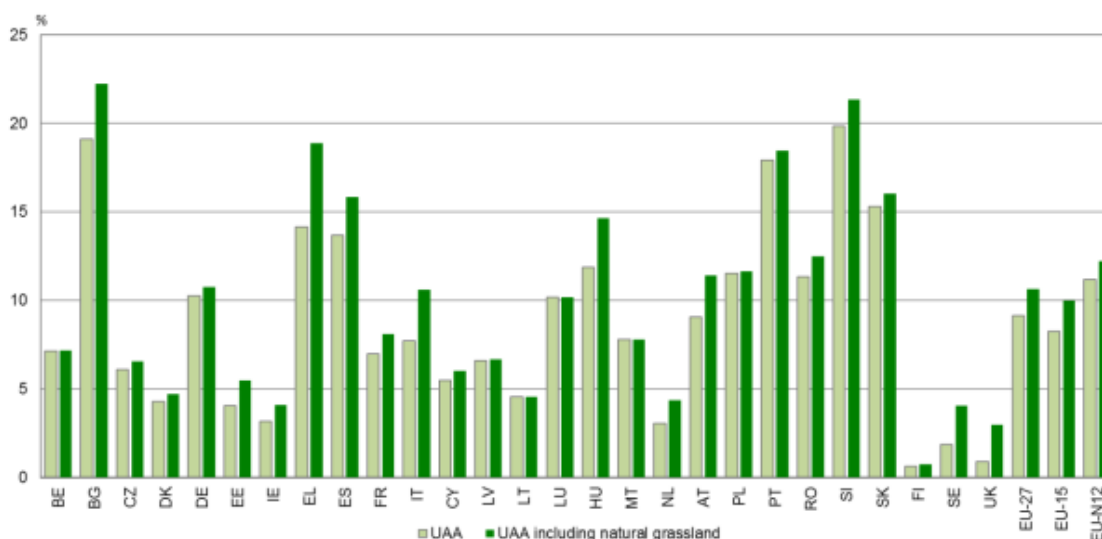
## 2. FARMLAND IN NATURA 2000

### **What can you find in this chapter?**

This chapter provides an overview of the role that different farming systems and practices play in supporting for the conservation of Natura 2000 habitats and species. It outlines the kind of farmland that is included in the Natura 2000 Network and identifies those habitats and species protected under the two EU nature Directives which are specifically linked to agricultural practices. It looks at their main pressures and threats within a farming context and at how various aspects of agricultural management can influence their conservation.

### 2.1 What kind of farmland is included in Natura 2000?

Agro-ecosystems<sup>10</sup> represent on average 38% of the total surface area of the Natura 2000 network in the EU (EEA, 2010), and Natura 2000 sites contain 10.6% (or 22.2 million ha) of the total agricultural land of the EU-27 (see figure 2.1).



**Figure 2.1 Proportion of agricultural land inside Natura 2000**

Note: the percentages of UAA under Natura 2000 are estimated using Corine Land Cover classes: CLC 2006 classes 2xx and 321 (CLC 2000 for EL). Source: European Commission, 2012. *Rural Development in the EU Statistical and Economic Information Report 2012*

<sup>10</sup> In this section, “agro-ecosystems” comprise the following CORINE Land Cover (CLC) classes:

- Regularly cultivated land, which includes non-irrigated arable land (CLC class 211), permanently irrigated land (212), rice-fields (213), vineyards (221), fruit trees and berry plantations (222), olive groves (223), pastures (231) and annual crops associated with permanent crops (241).
- Mixed cultivated land: complex cultivation patterns (242), agricultural area with significant areas of natural vegetation (243) and agro-forestry areas (244).
- Semi-natural areas with possible extensive agriculture practices: natural grasslands (321), moors and heathland (322), sclerophyllous vegetation (323).

It should be noted that the term ‘agricultural land’ in this context is much broader than the area classified as Utilised Agricultural Area in other contexts, such as in Community Farm Structure Surveys and Crops statistics<sup>11</sup>.

Most of the agricultural land in Natura 2000 has been managed by extensive systems of farming, and its continued existence is therefore heavily dependent on the continuation of such farming systems. The emphasis is very much on promoting positive conservation measures within farming systems that are both ecologically and economically sustainable. Low intensity farming systems that are included in Natura 2000 have usually developed over time, with farm structures and farming practices closely being adapted to local conditions. Broadly, they include:

- livestock systems where the forage areas are mainly semi-natural vegetation, including pastures, heath and scrub;
- low intensity arable systems (for example on poor soils, dry, saline or waterlogged areas, or in remote locations), often in rotation with semi-natural fallow vegetation;
- low intensity permanent crops, such as old traditionally managed orchards and olive groves; and
- mixed farming systems with arable and/or permanent crops with livestock. Such farming systems also include farmland with a mosaic of low intensity agriculture and valuable landscape features, which can support a high species biodiversity.

Low intensity **livestock systems** are often found in Natura 2000 sites because they maintain large areas of semi-natural pastures and meadows, heath and scrub, which host many plant and animal species of Community interest, and shape the landscape of our uplands and mountains and other areas. Species like the marmot (*Marmota marmota*) and some butterfly species of EU interest (eg *Colias myrmidone* and *Erebia calcaria*) are found in mountain pastures and meadows that are extensively grazed.

Low intensity **arable systems** such as dry cereal steppe lands are often designated as Natura 2000 sites because they support rare and highly threatened arable weed species, mammals such as the Romanian hamster (*Mesocricetus newtoni*) and European souslik (*Spermophilus citellus*), and large proportions of some globally threatened birds, including Great Bustard (*Otis tarda*) and Lesser Kestrel (*Falco naumanni*). The fallow or set-aside component of these arable systems is an essential part of their nature value, as well as the sparse and heterogeneous vegetation structure of both crops and fallow.

---

<sup>11</sup> In Community Farm Structure Surveys (FSS), utilised agricultural area (UAA) is the total area taken up by arable land, permanent grassland, permanent crops and kitchen gardens used by the holding, regardless of the type of tenure or of whether it is used as a part of common land. The UAA does not include unused agricultural land, woodland and land occupied by buildings, farmyards, tracks, ponds, etc. UAA is also defined within the context of Crops statistics (Council Regulation (EEC) No 837/90 of 26 March 1990 and Council Regulation (EEC) No 959/93 of 5 April 1993) respectively as 1) Area under cereal cultivation for each group of cereals and for any cereal (as specified in the annexes), production of which exceeds 50 000 tonnes per year and 2) ) Areas of arable land, permanent grassland, permanent crops and other parts of the UAA apart from arable land (land under crops other than cereals). Permanent grassland shall also include the parts of the UAA outside agricultural holdings. There are major differences at present between the UAA based on the Farm Structure Survey and on the Crop statistics due to the different definitions given in the surveys.

Low intensity **silvo-pastoral systems** that combine arable cropping and livestock grazing with trees, such as dehesa and montado, are a High Nature Value farming system with unique characteristics and support many species of Community interest, such as the Iberian Emerald Lizard (*Lacerta schreiberi*) and the Spanish Imperial Eagle (*Aquila adalberti*).

Low intensity **permanent crops**, including fruit and nut orchards, olive groves, and vineyards, are often found in Natura 2000 areas because their structural richness, including mosaics of terraces, hedges, grassland and other semi-natural vegetation features, provides suitable habitat for many species that were previously associated with open woodland and/or rocky habitats. Traditional orchards are suitable for wide-ranging species that require a complex of habitats as the Great crested newt (*Triturus cristatus*), and for some saproxylic insects dependent on decaying wood (eg. *Lucanus cervus*). Many bird species can be found on permanent crops (eg. *Hippolais olivetorum*). A variety of bat species forage over traditional orchards (eg *Rhinolophus hipposideros*). Low intensity permanent crops also valued for their landscape properties and their cultural and historic associations.

A few Natura 2000 species are also found on **intensively managed agricultural land**. These include some internationally important wintering populations of geese and swans, such as Barnacle Goose (*Branta leucopsis*) and Pink-footed Gosse (*Anser brachyrhynchus*) that occur graze intensive grassland and cereal crops in winter. The European hamster (*Cricetus cricetus*), which is listed in Annex IV of the Habitats Directive and therefore requires strict protection under Article 12, occurs on arable land where enough food resources and enough refuges in fodder crops and uncropped vegetation margins are available.

**Box 2.1. The relationship between High Nature Value farmland and Natura 2000**

The High Nature Value (HNV) farmland concept has been widely adopted across Europe in agricultural policy (see chapter 5 for details). High Nature Value farmland comprises those areas in Europe where agriculture is a major (usually dominant) land use and where that agriculture supports or is associated with either a high species and habitat diversity, or the presence of species of European, and/or national, and/or regional conservation concern or both.

Within this definition three types of HNV farmland are identified:

- 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.

In practice there is a considerable overlap between HNV farmland areas and farmland in Natura 2000, as the HNV type 3 has been identified using information from the Natura 2000 network, as well as from Important Bird Areas (IBAs), Prime Butterfly Areas (PBAs) and other suitable national biodiversity datasets (see Paracchini et al. 2008 for further details).

However, the two concepts are clearly distinct from on another. HNV Farmland is a broad concept covering all of biodiversity and has no legal force. Natura 2000 on the other hand is bound by EU legislation. Farmland areas are only included in Natura 2000 if they are of key importance for one or more of the EU protected species and habitats under the Habitats or Birds Directives (ie not all areas where the species and habitats are present are necessarily included in Natura 2000 – see chapter 3). Once included in Natura 2000, Member States are under the legal obligation to manage these sites in a way that ensures the conservation of the species and habitat types for which it has been designated.

See [Chapter 4](#) for more details on farming systems and habitat and species management.

## **2.2 Which habitats and species of Community interest are concerned?**

Many of the Natura 2000 habitats and species of Community interest that are protected under the Habitats and Birds Directives are dependent on, or associated with, agricultural practices (see Table 2.1). They are therefore given special focus in this guide and, for ease of reference, are referred to simply as “key farmland habitats” and “key farmland species”.

It should be noted that, under the terms of the Habitats Directive, only the most important core sites for these habitat types and species are included in Natura 2000, not all of the areas where they are present. As table 2.1 illustrates, for many habitat types only around 40%-60% of their total area is included in the Natura 2000 network.

### **2.2.1 Key farmland habitats of Community interest**

Annex I of the Habitats Directive lists 57 habitat types (of which 23 are priority habitat types<sup>12</sup>) which are considered to be key farmland habitats because they are dependent on or associated with extensive agricultural practices. They fall into eight broad habitat groups. These are described briefly below. More detailed information about each habitat type is included in Annex A.

Nearly half of these habitats (25) are considered to be fully dependent on appropriate agricultural practices (Halada et al, 2011). These are habitats where the species composition has been subject to selection over many decades or centuries and corresponds both to the site conditions and to type and intensity of human management. Both cessation of this management and significant changes in the management intensity result in (usually irreversible) changes in the habitat structure and species composition.

The other 27 habitats are considered to be partially dependent because management either prolongs the existence of the habitat by blocking succession, or enlarges/maintains an enlarged area of habitat distribution. Some habitats are partially dependent only for some sub-types or over part of their distribution. A few rare primary habitat types in the more extreme climatic conditions should be protected from any agricultural use.

---

<sup>12</sup> The Habitats Directive identifies a subset of 72 Annex I habitats as being priority natural habitat types because they are in danger of disappearance and because the Community has a particular responsibility for them in view of the proportion of their natural range which falls within the EU. Similarly a subset of Annex II species are identified as priority species because the Community has particular responsibility for them.

○ **Coastal and halophytic habitats**

Coastal salt meadows and marshes around the Atlantic, North Sea and Boreal coasts have often traditionally been grazed, and would deteriorate with rank vegetation if grazing were abandoned. Inland salt meadows and marshes are also seasonally grazed.



*Atlantic salt meadow with Limonium spp.*  
(Photo: Dr J.P. Doody)

○ **Coastal sand dunes and inland dunes**

Fixed dunes with grassland and scrub are often dependent on extensive grazing to stop succession and keep an open habitat. Machair is a special coastal sand landscape developed by centuries of low intensity grazing and rotating cultivation. Inland dunes and sandy heaths with grass and scrub need large-scale extensive grazing or mowing and small-scale disturbances to keep up a certain level of disturbance and keep down the scrub.



*Calcareous fixed dunes in Sefton Coast*  
(Photo: John Houston)

○ **Temperate and boreal heath and scrub**

Dry heaths are semi-natural habitats derived from woodland through a long history of grazing and burning. Historically they were used as permanent pasture within mixed farming systems. They also provided fuel, livestock bedding, winter fodder, thatching and even road building material. Wet heaths are also sometimes extensively grazed but are very sensitive to damage by over-grazing. Traditional alpine heaths have been seasonally grazed under a transhumance regime, as well as by wild grazing species; boreal heaths are grazed by reindeer.



*North Atlantic wet heaths in New Forest, England* (Photo: Steve Humble)

○ **Sclerophyllous scrub (matorral)**

Sclerophyllous scrub habitats are found around the Mediterranean. A few natural but rather rare zonal vegetation patches occupy sites with extreme conditions, most are secondary habitats formed by the destruction of oak forests and successive centuries of open grazing with sheep and goats and regular burning. Juniper scrub formations on heath or calcareous grassland are widespread in nearly all regions of Europe, and rely on extensive grazing to maintain their characteristic mosaic of scrub and grassland.



*Juniper matorral in Central Italy.*  
(Photo: Foreste Casentinesi National Park)

### ○ **Natural and semi-natural grasslands**

European grassland formations form a wide range of types and subtypes, from very dry, sparsely vegetated natural grasslands to alluvial meadows and wet *Molinia* meadows, and from alpine grasslands to dehesas with evergreen *Quercus* trees to steppe grasslands. Management systems and traditions are correspondingly varied. Hay meadows have the widest distribution.



*Species-rich grasslands in Czech Republic  
(Photo: National Park Krkonoše Administration)*

### ○ **Bogs and fens**

Most bogs provide very poor and sparse forage and are sensitive to grazing. Therefore, many are not grazed, and if they are this needs to be at a very carefully controlled. Fens are not generally agriculturally used, but some fen habitat types that are not too wet are used for light grazing or for harvesting livestock litter material.



*Alkaline fens with Cottongrass  
(Photo: Viera ŠeffEROVÁ StanOVÁ)*

### ○ **Rocky habitats**

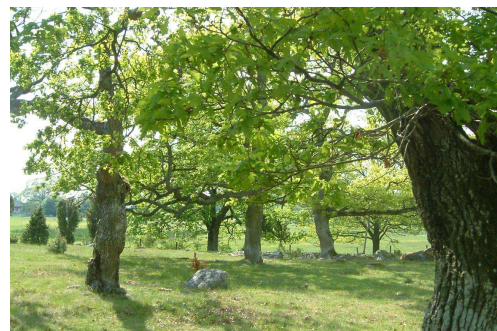
Limestone pavements need grazing and/or coppicing to keep them open, and are grazed as part of habitat mosaics with semi-natural grassland and scrub. Rocky habitats can also form part of larger grazed semi-natural habitat mosaics, for example in alpine pastures or nordic alvar grasslands.



*Limestone pavement in the Burren (Ireland)  
(Photo: Sharon L. Parr)*

### ○ **Wooded pastures and meadows**

The Fennoscandian wooded pastures and meadows are the remaining fragments of formerly widespread farming systems of grazing mixed with scattered trees and scrub, which were traditionally harvested for livestock forage.



*Wooded pasture in Sweden  
(Photo: Jens Johannesson)*

**Table 2.1 - Key agricultural habitats of Community interest**

**Key/sources:** **Agri dep** = dependency on agriculture (from Halada *et al* (2011): 3 = Fully dependent on agricultural management, 2 = Partially dependent, 1 = partially dependent but only for some sub-types or over part of the distribution. **Priority** = Priority Status according to Habitats Directive Annex I. **% SAC** = proportion of habitat that is protected within SACs as listed in Appendix to Coverage of habitats and species by the Natura 2000 network in the Article 17 report (ETC/BD, 2008). **% UFC**: The proportion of habitat area\* with unfavourable conservation status was calculated by totalling the sum of each habitat assessment per Member State and biogeographical region that was classified as being in overall unfavourable conservation status, and then dividing this by the total habitat area reported (ETC/BD 2008 Article 17 database). **% XX**: The proportion of habitat area with unknown conservation status was calculated in the same way. (NB: this assumes that all of the area within an unfavourably assessed habitat is in unfavourable status, whereas in the Article 17 reporting guidelines a certain proportion can still be in favourable status when the overall status is judged to be unfavourable). \* Excludes Romania (RO) and Bulgaria (BG). Presence of habitat in Romania and Bulgaria follows ETC/BD Habitat check list<sup>13</sup>.

Code	Habitat type	Agri dep	Priority habitat	% SAC	% UFC	% XX
1330	Atlantic salt meadows	1		65%	100%	0%
1340	Inland salt meadows	2	*	51%	100%	0%
1530	Pannonic salt steppes and salt marshes	1	*	55%	100%	0%
1630	Boreal Baltic coastal meadows	2	*	71%	100%	0%
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	1	*	57%	95%	1%
2140	Decalcified fixed dunes with <i>Empetrum nigrum</i>	1	*	58%	93%	0%
2150	Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> )	1	*	41%	28%	72%
2190	Humid dune slacks	2		51%	93%	6%
21A0	Machairs	3	*	27%	100%	0%
2250	Coastal dunes with <i>Juniperus</i> spp.	2	*	67%	76%	24%
2310	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>	1		68%	100%	0%
2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	1		43%	99%	1%
2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	1		43%	98%	2%
2340	Pannonic inland dunes	3	*	29%	100%	0%
4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	3		36%	100%	0%
4020	Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>	3	*	41%	16%	84%
4030	European dry heaths	3		37%	52%	47%
4040	Dry Atlantic coastal heaths with <i>Erica vagans</i>	3	*	33%	63%	0%
4060	Alpine and Boreal heaths	1		73%	22%	4%
4090	Endemic oro-Mediterranean heaths with gorse	2		62%	2%	91%
5120	Mountain <i>Cytisus purgans</i> formations	1		73%	0%	92%
5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	2		30%	47%	7%
5210	Arborescent matorral with <i>Juniperus</i> spp.	1		65%	0%	86%
5330	Thermo-Mediterranean and pre-desert scrub	1		69%	15%	77%
5420	<i>Sarcopoterium spinosum</i> phryganas	2		85%	0%	6%
5430	Endemic phryganas of the <i>Euphorbio-Verbascion</i>	2		79%	0%	7%
6110	Rupicolous calcareous or basophilic grasslands of the <i>Alyso-Sedion albi</i>	1	*	57%	12%	78%
6120	Xeric sand calcareous grasslands	2	*	18%	99%	1%
6140	Siliceous Pyrenean <i>Festuca eskia</i> grasslands	2		90%	64%	11

<sup>13</sup> ETC/BD (2012) Habitats check list. [http://bd.eionet.europa.eu/article17/reference\\_portal](http://bd.eionet.europa.eu/article17/reference_portal)

6150	Siliceous alpine and boreal grasslands	2		58%	10%	0%
6160	Oro-Iberian <i>Festuca indigesta</i> grasslands	2		68%	0%	100%
6170	Alpine and subalpine calcareous grasslands	2		64%	26%	31%
6180	Macaronesian mesophile grasslands	2		86%	100%	0%
6190	Rupicolous pannonic grasslands ( <i>Stipo-Festucetalia pallentis</i> )	3		47%	63%	0%
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> )	3		49%	49%	23%
6220	Pseudo-steppe with grasses and annuals of the <i>Thero-Brachypodietea</i>	3	*	60%	3%	82%
6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	3	*	37%	80%	2%
6240	Sub-pannonic steppic grassland	2	*	67%	100%	0%
6250	Pannonic loess steppic grasslands	3	*	39%	99%	1%
6260	Pannonic sand steppes	3	*	33%	100%	0%
6270	Fennoscandian lowland species-rich dry to mesic grasslands	3	*	22%	100%	0%
6280	Nordic alvar and precambrian calcareous flatrocks	3	*	54%	53%	0%
62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	3		95%	91%	0%
6310	Dehesas with evergreen <i>Quercus</i> spp.	3		65%	0%	98%
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	3		35%	94%	4%
6420	Mediterranean tall humid herb grasslands of the <i>Molinio-Holoschoenion</i> )	2		65%	3%	95%
6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	1		44%	77%	23%
6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	3		52%	100%	0%
6450	Northern boreal alluvial meadows	3		18%	100%	0%
6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	3		46%	89%	6%
6520	Mountain hay meadows	3		51%	99%	1%
6530	Fennoscandian wooded meadows	3	*	54%	100%	0%
7210	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricon davallianae</i>	1	*	26%	71%	2%
7230	Alkaline fens	2		43%	97%	0%
8230	Siliceous rock with pioneer vegetation of the <i>Sedo-Scleranthion</i> or of the <i>Sedo albi-Veronicion dillenii</i>	1		34%	9%	82%
8240	Limestone pavements	2	*	47%	27%	37%
9070	Fennoscandian wooded pastures	3		19%	100%	0%

### 2.2.2 Key farmland species of Community interest

Annex II of the Habitats Directive list 193 species that are associated with agro-ecosystems or grassland ecosystems. These key farmland species<sup>14</sup> include 115 plant species, 47 invertebrate species, 3 amphibians, 7 reptiles and 21 mammal species. From Annex I of the Birds Directive, 62 of the 195 birds listed are considered to be key farmland species<sup>15</sup>. All 255 species are listed in Annex B along with their habitat preferences.

A large proportion of these key farmland species are dependent on the continuation of extensive traditional farming practices for their survival in the EU. The majority of the species (200) are principally associated with grassland, 22 with extensive agricultural crop land, and 33 require both types of agricultural system. 11% of the species are *principally* found within agricultural areas.

#### ○ Plants

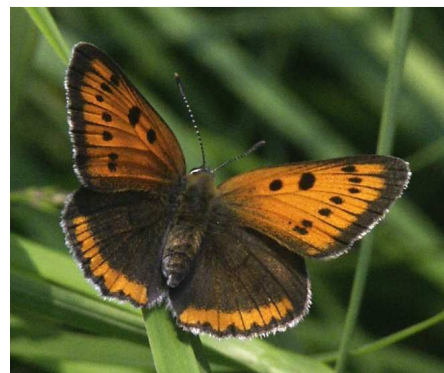
Some of the listed plant species are endemic to small areas where they are best protected by nature reserves, but other species were until recently more widespread and have declined because of the loss of their habitats and the traditional extensive farming practices that maintained them. The list includes arable weeds that used to be quite abundant and widespread across Europe, but now remain only in small fragmented populations in areas where extensive arable cereal cultivation still occurs.



*Iris humilis* in sand grasslands in Hungary (Photo: Wikimedia Commons)

#### ○ Invertebrates

The list of invertebrate species associated with grasslands includes 15 butterfly and 8 moth species. This includes butterfly species that until recently were widespread in hay meadows, wet meadows (*Molinia* and fen meadows) or calcareous pastures, but have suffered drastic reductions in populations due to the loss of these extensively farmed grasslands.



*Lycaena dispar* (Photo: P. Dzierza)

<sup>14</sup> The EU Biodiversity Baseline report (EEA, 2010) identified key agricultural species as those that use agro-ecosystems and/or grassland as their preferred habitat. The EEA's explanatory notes state that the nature of the link between species and their habitats are expressed in three categories:

- preferred habitat: main habitat of the species, species uses usually this habitat for its life or main part of population is linked to this habitat type
- suitable habitat: habitat in which species regularly occurs, but it is not preferred habitat or preferred habitat is not possible to determine (for species living regularly in several habitat types)
- occasional habitat: species lives sometimes in this habitat type, but only marginally or small part of the species population uses this habitat.

<sup>15</sup> Key farmland bird species are defined as those listed in Annex I of the Birds Directive that have more than 10% of their European population in one or more agricultural habitat types in at least one of their seasons (Tucker and Evans, 1997). The numbers of species using each habitat, priority species, dispersed species and species with an unfavourable status are listed in Annex B.

### ○ **Amphibians and reptiles**

The key farmland amphibian and reptile species are often closely associated with mixed mosaic farming areas that are rich in structural elements and farmland features such as ponds, dry stone walls and terraces, and orchards, vineyards or gardens. Other amphibian species may even live in modified habitats, as the Common Spadefoot (*Pelobates fuscus insubricus*) found in some rice fields of the Po Floodplain (North Italy);



*Vipera urisini* s primarily associated with open meadows

### ○ **Mammals**

The key farmland mammal species include some large grazers that use the extensive pastures created by seasonal or large-scale extensive livestock grazing systems, such as alpine pastures (eg the two chamois species *Rupicapra* spp) or grassland mosaics with woodland (eg European Bison *Bison bonasus*).

It also includes mammals that live in diverse mixed mosaic farming landscapes rich in structural elements, including the European Polecat (*Mustela putorius*), Cabrera's Vole (*Microtus cabreræ*), Greater Horseshoe Bat (*Rhinolophus ferrumequinum*), Severtzov's Birch Mouse (*Sicista subtilis*) and the two souslik species (*Spermophilus citellus* and *Spermophilus suslicus*).



European ground Squirrel, *Spermophilus citellus* (Photo: MME Archive)

### ○ **Birds**

Key farmland bird species are birds that have more than 10% of their European population in one or more agricultural habitat types for at least part of the year (see Annex B). Steppe grasslands are especially important as they are relatively restricted in the EU yet still hold significant populations of 32 key farmland bird species. Semi-natural Mediterranean shrublands and wet grasslands are also particularly important for birds.

Low intensity cereal systems (ie pseudo-steppe) are of high importance for a number of Annex I bird species (Bota et al, 2005). Typical farmland habitats are also of importance for a range of widespread generalist bird species listed on Annex I, many of which are relatively dispersed. Measures to improve the conservation status of such species will therefore need to be extended beyond Natura 2000 sites to the wider farmed environment.



Pin-tailed Sandgrouse, *Pterocles alchata* (Photo: J.M. Cereza)

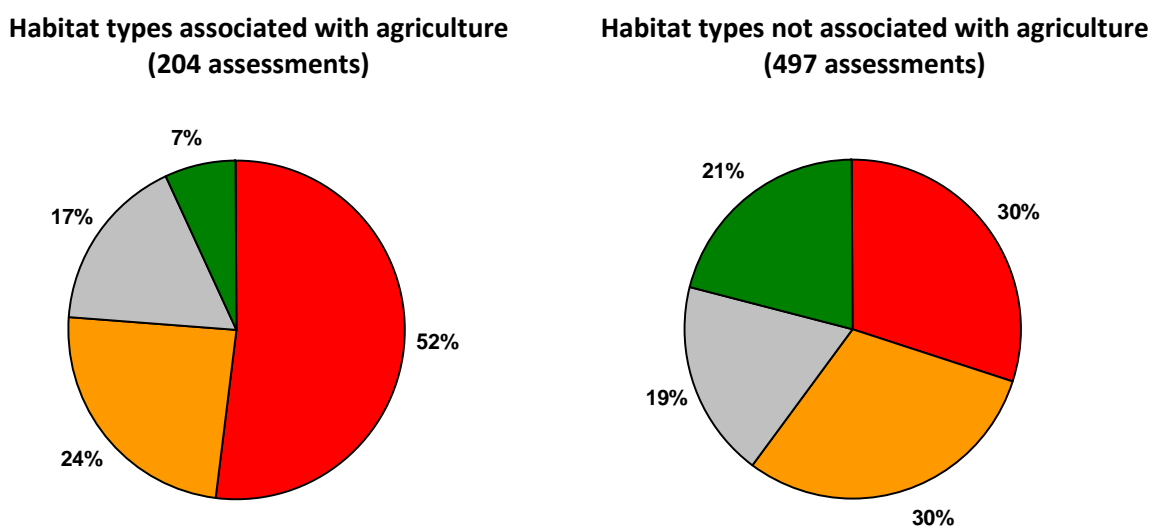
### 2.3 What is the current conservation status of habitats and species dependent on agriculture?

Member States must report every six years on the conservation status of habitats and species of Community interest within their territory (see box 2.3). The most recently published report for the period up to 2006 concluded that most of the key Natura 2000 habitats and species dependent on agriculture remain under threat – Member States have assessed 76% of the farmland habitats as having an unfavourable conservation status.

Comparing the assessments of **habitat types associated with agriculture** with those of other land uses, indicates that habitat types linked to agriculture generally have a worse conservation status, with only 7% of assessments being favourable, compared to 21% for ‘non-agricultural’ habitats (see figure 2.2). The reports submitted by the Member States show that grasslands in particular are under the most pressure.

The situation is especially severe in the Atlantic region where none of the habitats associated with agriculture were assessed as favourable. The Atlantic region has the highest pressure on agricultural land and includes some of the most intensively farmed areas in the EU. In the Pannonian and Mediterranean regions, the percentage of favourable assessments for these habitat types was 5% and 3% respectively. However, the situation in the Mediterranean region is complicated by the very high percentage of assessments being reported as being ‘unknown’.

**Figure 2.2. Conservation status of habitat types considered as being associated with agriculture compared to those not associated with agriculture**



Source: Composite Report on the Conservation Status of Habitat Types and Species as required under Article 17 of the Habitats Directive. European Commission, 2009. COM(2009) 358 final

The conservation status of 70% of species of European interest in agro-ecosystems is unfavourable, while only 3% are in favourable condition, and for 27% conservation status is unknown; as regards species of European interest in grassland ecosystems, 56% have unfavourable conservation status, while 15% are in favourable condition and for 29% conservation status is unknown.

**Box 2.2. Assessment of the conservation status of habitats and species of Community interest**

Member States must monitor the conservation status of the natural habitats and species of wild fauna and flora of Community interest present on their territory, ie all the habitats and species listed in the annexes of the Natura Directives. This provision is not restricted to Natura 2000 sites and data need to be collected both in and outside the Natura 2000 network to achieve a full appreciation of conservation status. The main results of this monitoring have to be reported to the Commission every six years according to Article 17 of the Habitats Directive.

The first systematic assessment of the conservation status of habitat types and species protected under the Habitats Directive was carried out in 2007 (covering the period 2001-2006) across 25 Member States and 11 (seven land and four marine) bio-geographical regions. Member States reported on the extent and status of each Natura 2000 habitat type and species within their territory in 2007, and also identified the possible causes of unfavourable conservation status for each habitat and species, using a standard list of threat codes, enabling a relatively comprehensive assessment of the importance of agriculture-related threats to agricultural habitats and species of Community interest. This reporting exercise has provided a first overview and point of reference for assessing future trends. The next report is due in 2013.

*Source: ETC/BD (2008) Habitats Directive Article 17 Technical Report (2001-2006). European Topic Centre on Biological Diversity. (<http://bd.eionet.europa.eu/article17>)*

There is no requirement under the Birds Directive for Member States to report on the conservation status of birds. Nevertheless, bird monitoring is widely carried out across the EU and it is clear that the majority of farmland birds are declining and many are threatened.

According to BirdLife International, 55 out of 62 farmland species were judged to have an unfavourable conservation status in the EU in 2004 (Birdlife International, 2004). This very high proportion of species with an unfavourable status clearly shows the importance of implementing conservation measures for farmland bird species. Furthermore, 20 of the 62 key bird species have been identified as priority species, and therefore in need of additional special protection measures such as species actions plans<sup>16</sup>.

These findings reinforce the conclusion that conservation measures for farmland are needed to ensure the aims of the Habitats Directive are met. Such measures are especially important in grassland habitats, within which the majority of key farmland species are associated. This clearly shows the importance of these habitats and the need for measures to be developed and put in place to support the farmers and specific farming systems and practices that are essential for the long-term conservation of these habitats.

---

<sup>16</sup> Although the Birds Directive does not identify priority bird species, the Ornithological Committee (which advises the Commission on the implementation of the Directive) has agreed a list of 51 species and subspecies that are considered as priority for the purpose of LIFE Nature funding and the development of action plans. These priority species include all globally threatened species that regularly occur in the EU, as well as other some other species that are particularly threatened are a result of their rarity and/or rapidly declining populations.

## 2.4 What are the main drivers of agricultural change that need to be addressed?

Several studies have found that extensive farming systems within Natura 2000 sites, and other areas of HNV farmland, are highly vulnerable to **agricultural abandonment** (IEEP and Veenecology, 2005; Keenleyside and Tucker, 2010; Poláková et al, 2011; Zimmermann et al, 2010).

Agricultural abandonment is driven by a complex range of drivers that undermine the viability of farming under the current land use and socio-economic context in each area (Keenleyside & Tucker, 2010). Farming in these areas is challenged by a combination of social, economic, political and environmental factors, for example declining meat prices, labour and time constraints, poor access to markets, ageing rural populations, soil erosion, and constraints to productivity and mechanisation posed by geographical factors such as steep slopes or low soil fertility (IEEP & Veenecology, 2005; Keenleyside & Tucker, 2010).

Extensive livestock management has become unprofitable in many agricultural regions resulting in either abandonment or intensification in the absence of financial support (Beaufoy and Marsden, 2010). In Eastern Europe the closure of many state farms resulted in a dramatic decline in livestock numbers and the abandonment of large areas of grazing land.

Projections of areas currently most at risk from abandonment identify mountainous and hilly areas (Keenleyside & Tucker, 2010). Most of the habitats in these areas have poor forage value and low rates of productivity meaning that such systems are often in today's market only marginally profitable in terms of their agricultural products (Ecologic, 2006a). A UK survey found that a third of upland farmers have reduced or stopped grazing on moorland within the last four years (Clothier and Finch, 2012).

By contrast, the second most important pressure on key farmland habitats and species is the **intensification of management**. Over the last hundred years and particularly since the 1950s, drivers of agricultural development (such as increasing commodity markets and prices, technological advances and market measures and support under the CAP) have led to widespread agricultural improvements and the intensification of management.

This has led to significant changes in agricultural habitats, such that many of the natural and semi-natural elements that remained have been lost, resulting in highly modified and simplified agricultural systems. Many of the habitats are affected by a combination of abandonment in some areas and intensification in other areas.

## 2.5 What are the main pressures and threats to habitats and species dependent on agriculture?

This section summarises the main pressures on the key farmland habitats and species related to changes in agricultural practices<sup>17</sup>. The results are shown in Figure 2.3 and 2.4.

---

<sup>17</sup> A detailed assessment of agricultural practices that affect key farmland habitats was carried out on the basis of published literature and expert opinion. Detailed assessments of pressures were also carried out for the key farmland species. The assessment is based on the reporting by Member States on the conservation status of habitats and species

The assessment shows that the abandonment of extensive traditional livestock farming practices is the most important pressure on key farmland habitats, as described above. At the same time, other pressures linked to intensification of farming practices are also negatively affecting farmland habitats and species of Community interest.

As would be expected, the major pressures on key farmland species largely mirror those on the habitats in which they are found. Pressures related to grazing or mowing management comprise the most significant pressure class, followed by fertilisation, cultivation, afforestation and hydrological changes. Over half of the species are affected by under-grazing and/or over-grazing, whilst other changes to grazing practices, such as a change in stock type or lack of shepherding, is affecting at least 32% of the species analysed.

#### ○ **Lack of grazing and/or hay cutting**

Under-grazing was found to affect two-thirds of the analysed habitats, with nine of these critically threatened owing to the complete cessation of this management. Under-grazing, including abandonment, is also a significant factor affecting the majority of the species across all taxa groups. The decline or abandonment of hay cutting practices is affecting all Annex I meadow habitats, with evidence of this posing a critical threat to nearly half of the meadow habitat types.

Cessation of mowing for just a few years reduces hay meadow plant species richness (Baur et al, 2006; Dover et al, 2011). Abandoned pastures may initially show an increase in the abundance of plant species of conservation importance, but lose overall species richness, particularly rosette-forming and spring-flowering species (Vassilev et al, 2011). If abandoned for extended periods, habitats will often undergo succession to woody shrub communities and forest. Scrub and heath habitats are also dependent on low intensity grazing to prevent succession (Calaciura and Spinelli, 2008) and to maintain species diversity (Papanikolaou et al, 2011).

#### ○ **Lack of shepherding**

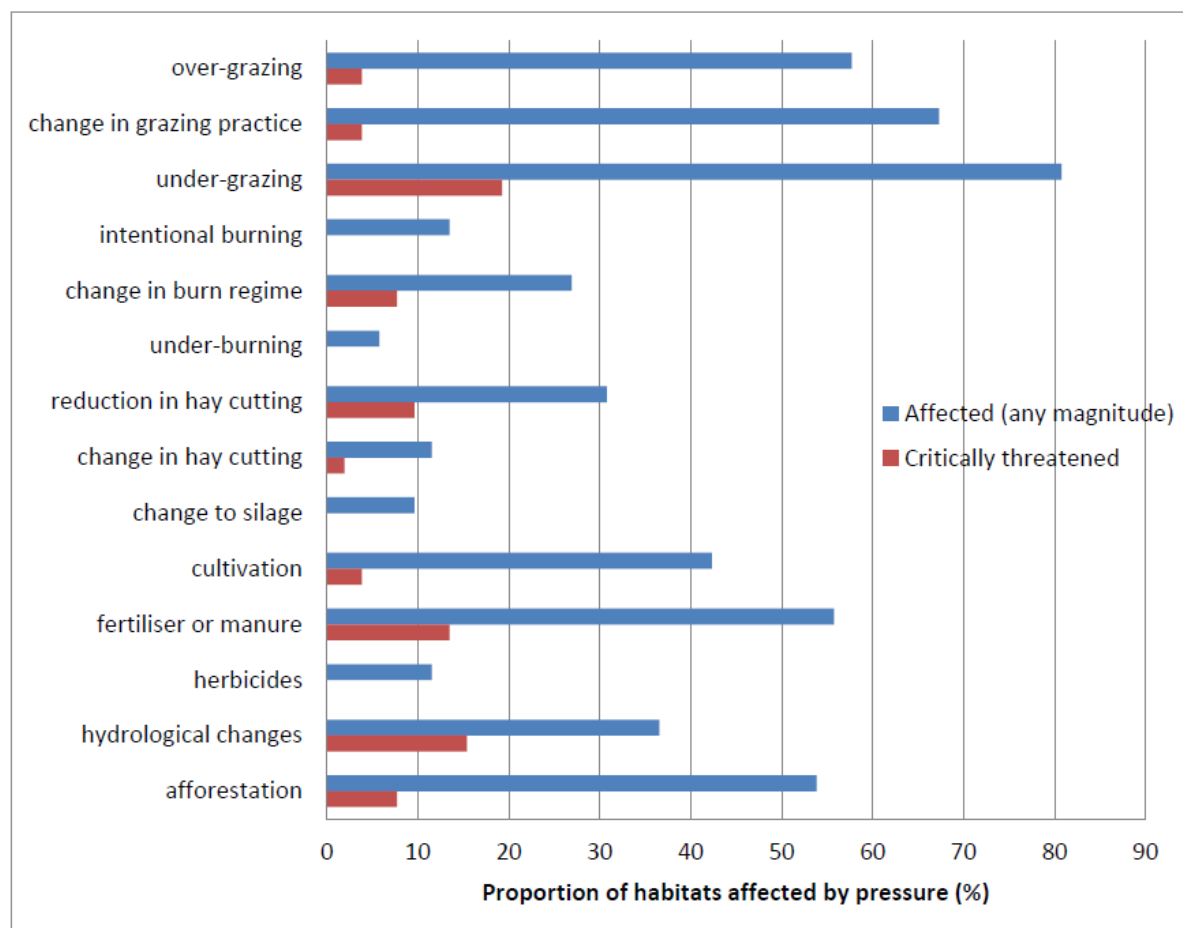
The decline in shepherded grazing over recent decades has had negative consequences for large areas of semi-natural grazed habitats, leading to scrub encroachment but also over-grazing in some areas (García-González, 2008; Rochon et al, 2009). Consequently, the most widespread pressure for key farmland species is abandonment of extensive pastoralist grazing systems and scrub encroachment on grasslands. The limited availability and high cost of skilled shepherds is a widespread problem throughout common grazing land areas in many regions of South and Eastern Europe (García-González, 2008; Pardini and Nori, 2011).

---

included in the Habitats Directive in 2007, as well as on scientific literature and expert opinion (references are listed in Annexes B and D).

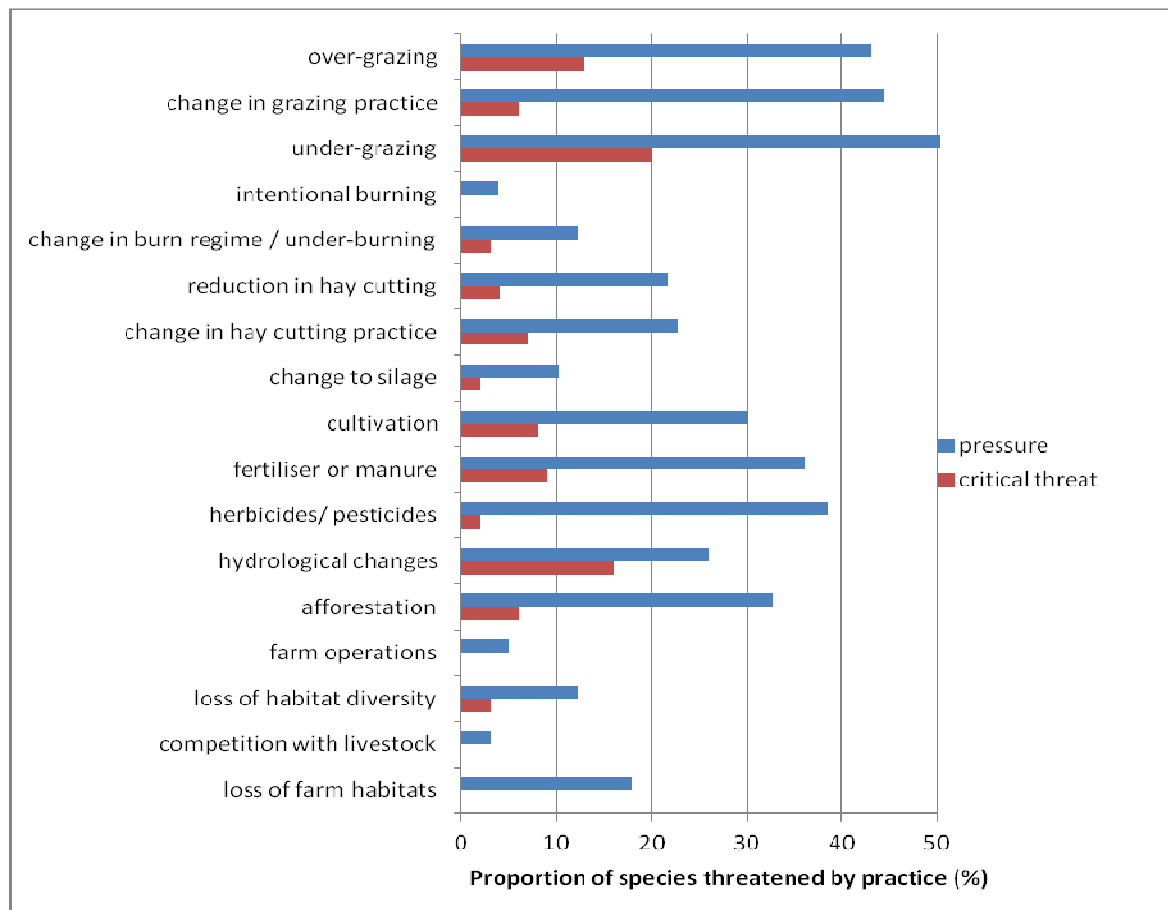
**Figure 2.3. Proportion of the key agricultural habitats affected by each pressure, and proportion of critical threats**

**Key:** **over-grazing** = high stocking rates or long grazing periods that damage habitat (incl vegetation change, soil compaction & erosion, eutrophication, trampling of nests); **change in grazing practice** = changes in timing and stock type, use of supplementary feed and lack of shepherding; **under-grazing** = too little grazing pressure to maintain habitat status, including abandonment; **intentional burning** = burning (for agricultural or other purposes) that damages habitat status; **change in burn regime** = ; **under-burning** = reduction or cessation of burning that reduces conservation status, through lack of controlled burning management or through prevention of natural fires; **reduction in hay cutting** = reduction or cessation of hay cutting due to abandonment; **change in hay cutting** = changes in timing of cutting, mechanisation and other unspecified changes in the practice; **change to silage** = change from hay or pasture to cutting for silage; **cultivation** = conversion to intensive grassland through ploughing, fertilising and reseeding, or conversion to arable crops; **fertiliser or manure** = use of farmyard manure and/or artificial fertilisers; **herbicides** = herbicide use that damages conservation status of habitat or species, or pesticide use that damages species; **hydrological changes** = including drainage of wetlands, prevention of natural flooding through modification of natural river or coastal dynamics, changes in groundwater dynamics due to abstraction for irrigation; **afforestation** = intentional planting of forestry species, not natural regeneration.



**Figure 2.4 – Proportion of key agricultural species affected by each pressure and the degree of the threat**

**Key:** see above; **farm operations** = death of animals that cannot get out of the way of machinery; **loss of habitat diversity** = crop specialisation / reduced rotations/ loss of habitat mosaic through agricultural intensification; **competition with livestock** = competition for habitat or food with game or livestock species or disease transmitted by these species; **loss of farm habitats** = loss of farmland habitat features (eg hedges, stone walls, terraces, rough grass margins, woodlots, trees, ponds, old buildings).



○ **Intensification of farming practices, over-grazing and high stocking levels, supplementary feeding**

In Natura 2000 areas where there is potential to increase agricultural productivity or change livestock management, habitats are often affected by the intensification of agricultural practices. Over half of the habitats and species analysed are affected by over-intensive grazing in some parts of their distribution. The impact of over-grazing on marginal grasslands has decreased since the CAP direct payments have been decoupled from livestock numbers (UK NEA, 2011). However, over-grazing is still happening in some areas due to the lack of shepherding, changes in livestock type, and lack of other livestock control systems such as rotational grazing.

Supplementary feeding of livestock also allows increases in livestock densities and changes the seasonality of grazing, increasing grazing pressure. Furthermore, unless feeders are regularly moved, the concentration of livestock around feeders can cause high levels of

localised soil erosion and eutrophication, and under-grazing of vegetation that is far away from them.

#### ○ *Changes in mowing practices and mechanisation*

The mechanisation and intensification of grass cutting has large-scale negative impacts on grassland plants, animals and communities. Traditional hay harvesting used to create a mosaic of differently mown patches because of the small field parcel sizes, manual harvesting, and local demand and supply. Modern mechanised harvesting of grass (for example for silage production or as fodder for housed livestock) generally removes grass over large land areas simultaneously, which results in the instantaneous and complete destruction of habitats for invertebrates and birds and also synchronises sward regrowth across the whole area, reducing habitat heterogeneity and affecting those species that require patches of bare ground or short swards (Cizek et al, 2012). Modern farm machinery also directly kills most small animals that cannot get away in time, such as grasshoppers, bees, amphibians and some late breeding birds (Humbert et al, 2009).

#### ○ *Fertilisers and lime*

Most semi-natural grasslands are nutrient poor and are extremely sensitive to fertilisation. The use of fertiliser has profound impacts on plant communities, typically reducing species diversity and increasing vegetation height and density (Cop et al, 2009; Gibson, 2009). Most of the Natura 2000 habitat types are also extremely sensitive to liming, which changes the soil pH, and therefore changes the nutrient balance of the soil. Most Annex I dry grassland habitat types cannot tolerate any fertilisation, and both nitrogen and phosphorus have important impacts (Ceulemans et al, 2012).

Several key plants dependent on grazed habitats decline with increasing fertilisation due to the expansion of more dominant species that are better able to exploit the enhanced availability of nutrients (Firbank et al, 2008). Many invertebrate species associated with low-nutrient habitats are impacted detrimentally by this change in the plant communities that results in the loss of their specific adult and larval food plants (Orbicon, Écosphère, ATECMA, Ecosystems LTD, 2009).

Some hay meadows receive small amounts of farmyard manure to offset the losses of nutrients through hay removal and maintain productivity, and this is sometimes necessary to maintain the hay meadow plant community. However, applications of liquid slurry or artificial fertilisers, combined with frequent cutting for silage production, lead to the dominance of grasses and cause significant changes in species composition, destroying the habitat value (Stoate et al, 2009; Zechmeister et al, 2003).

#### ○ *Herbicides and pesticides*

The use of herbicides and/or pesticides affects many species in some way, although this is usually not a large-scale problem on grassland. For plants, this is through the direct impact of the agrochemicals, but also due to the loss of species providing pollinator and/or pest control functions (Geiger et al, 2010; Haughton et al, 2001). In the case of many of the reptile, amphibian, bird and mammal species, the impact is generally indirect and due to the

decline in plant or invertebrate species used as food sources (Campbell et al, 1997; IUCN, 2011; Morris et al, 2005).

However, agrochemicals can also directly impact the health of reptiles and amphibians through pollution of watercourses and by increasing their vulnerability to parasites and disease (Christin et al, 2009). The increase in use of avermectins or other antihelminthics against parasites of livestock is negatively affecting invertebrates in dung, and the birds and bats that feed on them (Beynon, 2012; Vickery et al, 2001). Anticoagulant rodenticides used to control vole populations are poisonous to both grain-eaters and the raptors that eat the voles, and are responsible for significant numbers of deaths of Natura 2000 species (Lemus et al, 2011; Sánchez-Barbudo et al, 2012).

○ **Intensification of grassland use or cultivation and conversion to arable**

The intensification of grassland use through fertilisation, reseeding and drainage to enable silage production has very negative effects on Natura 2000 habitats (Buckingham et al, 2010). Plants and invertebrate species associated with natural or extensively managed grasslands, such as the Large Blue Butterfly (*Maculinea arion*), are particularly affected (Orbicon, Écosphère, ATECMA, Ecosystems LTD, 2009).

○ **Changes in extensive arable farmland practices**

The species principally associated with extensive cereal systems are particularly affected by either abandonment or the intensification of management. For example, the Lesser Kestrel (*Falco naumanni*), Great Bustard (*Otis tarda*) and Little Bustard (*Tetrax tetrax*) are dependent on low-intensity cereal growing rotated and mixed with fallow and sheep grazing in Spain (Catry et al, 2011; SEO & Birdlife International, 2011). Other species affected by intensification on Iberian cereal steppes include Tawny Pipit (*Anthus campestris*), Calandra Lark (*Melanocorypha calandra*), Eurasian Golden Plover (*Pluvialis apricaria*), and White Stork (*Ciconia ciconia*) (Delgado and Moreira, 2000). Plants have been especially impacted by changes to traditional arable farming practices. For example, *Bromus grossus*, *Centaurea lactiflora*, *Ononis hackelii*, *Linaria ricardoii*, *Santolina semidentata* and *Notothylas orbicularis* occur as weeds in traditional cereal crops, but improved seed controls and change in agricultural practices (more intensive soil cultivation, lack of winter stubble period, herbicides, and fertilisation) have led to drastic declines in their populations (BfN, 2011; ICNB, 2006).

○ **Lack of controlled burning management – under-burning, over-burning and wildfire damage**

Some grassland and many scrub and heath habitat types have been traditionally managed by controlled burning, to promote new nutritious vegetation growth for livestock and to halt succession to forest. If active burning management is abandoned, with concurrent abandonment of grazing, heathland habitats can become dominated by a few species and lose biodiversity. Furthermore, the increasing dominance of shrubby species and the accumulation of litter can lead to uncontrolled and intense wildfires due to the availability of combustible woody biomass. Such intense burning can spread over very large areas, resulting in significant soil damage (especially on peatlands) increased run-off and erosion, and may have long-term ecosystem impacts.

### ○ **Loss of habitat features in agricultural landscapes**

Many species are particularly dependent on farm boundary habitats (hedges, stone walls, ditches etc.) or other habitat features associated with farmland (ponds, buildings, etc.). Threatened reptiles (eg *Vipera xanthine*, *Elaphe situla*) live in traditionally cultivated land, dry stone walls and terraces and hedgerows, and are affected by habitat loss due to intensification of agricultural practices and loss of traditional farmland (IUCN, 2011; Temple and Cox, 2009).

### ○ **Loss of habitat diversity**

Some species are particularly dependent on a mosaic of diverse habitats within their population range (Batáry et al, 2007a; Batáry et al, 2007b). For example, all known populations of the Danube Clouded Yellow butterfly (*Colias myrmidone*) inhabit, or have inhabited, very diverse landscapes that include pastures, hay meadows, arable land, fallow land, scrubland, open woodland and forest (European Commission, 2010a). The species has two annual generations that have partly contrasting needs, and these cannot be provided for under just one land-use or on one plot. A diverse and dynamic land-use in the wider landscape is essential for the provision of all the necessary resources for each generation, over successive years. These fine-grained landscapes were created over past centuries by traditional land-uses, as a result of interactions between their physical diversity, in terms of topography, soils and climate, and historic cultural factors, such as ownership patterns and management methods.

### ○ **Other farm operations or infrastructure**

The erection of fencing in open habitats can pose a significant threat for some large birds that are not very manoeuvrable in flight. Such species require large open habitats and therefore the use of fencing in habitats such as steppes can have a major impact on species such as the Great Bustard (*Otis tarda*) (Bota et al, 2005), while Black Grouse (*Tetrao tetrix*) frequently collide with deer fencing on moorlands in the UK (Baines and Andrew, 2003; Baines and Summers, 1997).

### ○ **Changes in hydrology**

A quarter of the species and one third of the habitats are affected by changes in their hydrology and eight habitats are critically threatened by such changes. In many cases, the damage is due to drainage of land to allow agriculture, commercial forestry, or the development of infrastructure (Middleton et al, 2006). Artificial drainage is achieved through the digging of channels or ditches and the use of dams and sluice gates to redirect water flow (Holden et al, 2004). This leads to lowered water tables and the drying out of habitats with resulting changes to physical and chemical properties and a consequent loss of characteristic ecological communities (ŠeffEROVÁ et al, 2008a; ŠeffEROVÁ et al, 2008b).

Wet grasslands and meadows are very sensitive to changes in groundwater levels resulting from over-abstraction, lowering of drainage channels, or embankment of rivers (Houston, 2008). Ancient waterway systems constructed to supply water meadows and upland pastures are also important habitats for plants and animals, but are increasingly rare (Küster and Keenleyside, 2009).

### ○ **Afforestation**

Afforestation is reported as a major pressure on abandoned pastures and meadows, including fixed dunes, inland dunes and xeric sand calcareous grasslands afforested with conifers.

The maintenance of farming practices, in particular of some traditional extensive farming systems is key to nature conservation and Natura 2000 sites. Such traditional farming systems are threatened by the abandonment of agricultural practices in many areas of Europe and there is a need to act in order to keep them in the territory; this requires providing sufficient and adequate support to farmers that face the above-mentioned socio-economic challenges, taking into account the environmental services they provide.

### **Further information**

- *Annexes A, B and C provide further information about habitats types and species that are dependent on or associated with agricultural management, their distribution and current conservation status.*
- *The Commission provides guidelines on the management of Natura 2000 sites, and on appropriate assessments and compensation. Available at:*  
[http://ec.europa.eu/environment/nature/natura2000/management/guidance\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm)
- *The Assessment of conservation status of all habitats and species of Community Interest in Article 17 reporting is available at:* <http://bd.eionet.europa.eu/article17>  
[http://ec.europa.eu/environment/nature/knowledge/rep\\_habitats/index\\_en.htm](http://ec.europa.eu/environment/nature/knowledge/rep_habitats/index_en.htm)
- *Indicators in the Rural Development Report 2011 (European Commission). Natura 2000:*  
[http://ec.europa.eu/agriculture/statistics/indicators/rd-2011/c10\\_en.pdf](http://ec.europa.eu/agriculture/statistics/indicators/rd-2011/c10_en.pdf)
- *EU Biodiversity Baseline:* <http://www.eea.europa.eu/publications/eu-2010-biodiversity-baseline>
- *High Nature Value farming systems across Europe are described in Oppermann et al (2012). High Nature Value Farming in Europe. 35 European countries - experiences and perspectives. Ubstadt-Weiher, verlag regionalkultur. See:*  
<http://efnecp.org/publications/books/>
- *The European Commission has published guidance on measures to reduce fragmentation (Kettunen et al, 2007). See:*  
[http://ec.europa.eu/environment/nature/ecosystems/docs/adaptation\\_fragmentation\\_guidelines.pdf](http://ec.europa.eu/environment/nature/ecosystems/docs/adaptation_fragmentation_guidelines.pdf)
- *The European Commission has produced a series of studies to assist in the preparation of the Green infrastructure Strategy. See:*  
<http://ec.europa.eu/environment/nature/ecosystems/studies.htm>

### 3. AN OVERVIEW OF THE MANAGEMENT REQUIREMENTS FOR NATURA 2000

#### **What does this chapter do?**

*This chapter explains the legal provisions that must be implemented within all Natura 2000 sites to ensure their conservation management in accordance with Article 6 of the Habitats Directive. Key concepts such as achieving favourable conservation status, setting site level conservation objectives, and implementing the necessary conservation measures are explained and illustrated.*

*The chapter also outlines how article 6.1 can be implemented in Natura 2000 sites that contain substantial areas of farmland, bearing in mind that the management planning process will necessarily vary from one site to another depending on the ecological requirements of the species and habitats of EU importance present, as well as the socio-economic circumstances and physical characteristics of each site.*

#### **3.1 How are Natura 2000 sites to be managed and protected?**

As stated in previous chapters, the Habitats and Birds Directives require Member States, amongst others, to designate sites under the Natura 2000 Network to ensure the conservation of a number of rare and threatened species and habitat types of EU importance covered by the two Directives.

It is important to recall that only core areas for these species and habitats are to be included in Natura 2000, it does not require *all* of the areas where they occur to be designated. Other measures are foreseen within the two nature Directives for the protection and conservation of species and habitats of EU importance outside Natura 2000, but as the main focus of these guidelines is on managing Natura 2000 sites, these provisions are not elaborated further here<sup>18</sup>.

Once a site has been included in the Natura 2000 Network, Member States are required to manage and protect it in accordance with the terms of Article 6 of the Habitats Directive. Article 6 contains three key provisions; it requires Member States to:

- Implement, on each site, the **necessary conservation measures** which correspond to the ecological requirements of the protected habitat types and species of Community interest present (Article 6.1);
- **Prevent any damaging activities** that could significantly disturb these species or deteriorate their habitats or protected habitat types present (Article 6.2).

<sup>18</sup> For more information on this go to [http://ec.europa.eu/environment/nature/conservation/index\\_en.htm](http://ec.europa.eu/environment/nature/conservation/index_en.htm)

- **Protect the site from new potentially damaging projects and plans** by setting out a series of procedural and substantive safeguards governing plans and projects likely to have a significant effect on a Natura 2000 site (Article 6.3 and 6.4).

Within this structure, it can be seen that Natura 2000 sites are not strictly protected areas where all activities are systematically excluded. It advocates a different approach: one that fully recognizes that humans are an integral part of nature and that the two work best in partnership with one another. In this way, Natura 2000 supports the principle of sustainable development and use. Its aim is not to exclude economic activities, but instead to set the parameters by which these can take place whilst safeguarding Europe's most threatened and valuable species and habitats.

- **Reaching a 'favourable conservation status'**

The overall objective of the two EU nature Directives is to ensure that the species and habitats they aim to protect reach a 'favourable conservation status' across their natural range within the EU. This objective is defined in a positive way. Thus it is not enough to simply prevent the further degradation or disappearance of the species and habitats listed in the EU Nature Directives. Member States must also take positive measures to maintain and restore these species and habitats to a favourable conservation status.

Natura 2000 sites have a crucial role to play in achieving this overall objective since they harbour the most important core sites for these species and habitats. Each site must therefore be managed in a way that ensures it contributes as effectively as possible to helping the species and habitats for which it has been designated reach a favourable conservation status within the EU.

The fact that many species and habitats of EU importance currently have an unfavourable conservation status (see chapter 2) stresses the importance of implementing the provisions of Article 6.1 since it is clear that many species and habitats will require active conservation restoration measures within Natura 2000 if they are to have any hope of reach a favourable conservation status.

- **Setting conservation objectives**

To ensure that each Natura 2000 contributes fully to reaching this overall target of FCS, it is important to set clear **conservation objectives** for each individual site. These should define the desired state, within that particular site, of each of the species and habitat types for which the site was designated.

This is best done quantitatively wherever possible or appropriate, for instance by setting specific time bound targets for each of the habitat types and species of EU importance present (eg increase population of corncrake to 20 pairs within 8 years, increase the area of wet meadow in good conservation condition by 100 ha).

### What is favourable conservation status ?

The term **conservation status** is defined in the Habitats Directive (article 1).

- For a natural habitat, conservation status means *“the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2”* (article 1e).
- For a species, the conservation status means *“the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2”* (article 1i).

The conservation status of a **natural habitat** will be taken as ‘favourable’ when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable as defined below.

The conservation status of a **species** will be taken as ‘favourable’ when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

- **Identifying the necessary conservation measures**

Once the conservation objectives have been set, the **necessary conservation measures** that are required in order to fulfil these objectives and targets should be identified and negotiated with all involved so that they are effectively implemented. These must correspond to the ecological requirements of the habitats and species for which the site is designated.

**Article 6(1):** *“For special areas of conservation, Member States shall **establish the necessary conservation measures** involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitat types in Annex I and the species in Annex II present on the sites”*

In this respect it is important to recall that the obligations arising out of Article 6.1 are obligatory, and not optional. In other words Member States must introduce the necessary conservation measures in all cases, and not just ‘if need be’. The measures themselves can include both active management and restoration works, such as regular mowing or removal of invading scrub, as well as passive ‘non-intervention’ actions such as leaving uncultivated or fallow areas.

### Legal interpretation as regards article 6.1

A court ruling (Case C-508/04) has stated that a Member State cannot escape from taking all the necessary conservation measures in Natura 2000 sites. *“It is apparent from Article 6(1) of the Directive that the ‘necessary conservation measures’ must be adopted in all cases, and not ‘if need be’<sup>19</sup>. In Article 6(1) the words ‘if need be’ concern only management plans and cannot be understood as a general restriction on the obligation to adopt the necessary statutory, administrative or contractual measures....*

*The Directive requires the adoption of necessary conservation measures, a fact which excludes any discretion in this regard on the part of the Member States .... Moreover, mere administrative practices, which by their nature are alterable at will by the authorities and are not given the appropriate publicity, cannot be regarded as constituting fulfilment of the obligations owed by the Member States in the context of transposition of a directive”.*

How these conservation measures are to be implemented will vary from site to site depending on the individual conditions in each (eg is it privately owned land or public). Article 6.1 allows a large degree of flexibility in this respect, and leaves it up to each Member State to decide what is the best means of implementing the necessary conservation measures. It can involving, if need be, appropriate **management plans** specifically designed for the sites or integrated into other development plans, and appropriate **statutory, administrative or contractual measures**.

Many Member States use management plans as a tool to guide managers and other interested parties in dealing with the conservation of Natura 2000 sites. In general management plans at site level are used to formulate the site’s conservation objectives together with the measures necessary to attain these objectives (although other instruments can be used as well provided that the aim of those instruments are also to implement the conservation objectives).

Management plans can also function as a tool to lay down the respective responsibilities of the different socio-economic stakeholders, authorities and NGOs in implementing the necessary conservation measures that have been identified.

Management plans can be stand-alone documents or can also be ‘integrated into other development plans’, in conformity with the principle of integration of the environment into other Community policies. In the case of an integrated plan, it is important to ensure that clear targets and conservation measures are set for the relevant habitats and species concerned within that site.

---

<sup>19</sup> The Austrian Government contended that the obligation laid down in Article 6(1) was not to adopt conservation measures in all cases, but only the ‘necessary’ conservation measures. In any event, where such measures were required in addition to the obligations and prohibitions to be laid down pursuant to Austrian law, they were indeed taken by the competent authorities of the Province in order to achieve a favourable conservation status.

Another advantage of a management plan is that it provides a useful tool for ensuring the implementation of article 6.1 provisions is done in a clear and transparent way, enabling all stakeholders to be informed about what Natura 2000 sets out to achieve and inciting their active participation in this discussion. Management plans may also help to get funding for the measures and achieve better integration into other plans.

It must however be noted that existing management plans for other protected area categories (eg. National or Natural Parks, etc.) are not always sufficient to address the management of Natura 2000 sites and should therefore be adapted to the specific conservation objectives pursued in these sites in function of the species and habitats **of European importance** present.

Although management plans for Natura 2000 sites are only suggested in the Habitats Directive, these plans seem to be a preferred option for most Member States and are even considered obligatory in many of them.

### 3.2 implementing Article 6.1 on Natura 2000 farmland sites

This next section outlines the steps that are needed in order to implement Article 6.1 in Natura 2000 sites which contain substantial areas of farmland. The extent to which each of these steps are to be taken will of course vary from one site to another depending on both the ecological requirements of the species and habitats of EU importance present as well as the socio-economic circumstances and physical characteristics of each site. The steps listed below are therefore only indicative and are intended to help illustrate how Member States might go about implementing Article 6.1

- **Identifying Natura 2000 farmland and farming systems**

Identifying Natura 2000 farmland firstly requires mapping or otherwise locating the key farmland habitats and the farmed areas used by key species. In this respect, it is important to include partially or recently abandoned key farmland habitats that could be restored, even if there is little or no evidence of current farming activity. It should be noted that Member State records of Utilised Agricultural Area (UAA) may not capture all Natura 2000 (or HNV) farmland, and in some cases considerable areas of key habitats managed by farmers are not recorded as UAA.

A second stage is to identify the farming systems that are present in this farmland (or were until recently, in the case of abandoned land). Many farming systems are complex, using different parcels of land, sometimes widely separated, for different purposes that all contribute to the functioning of the farm. Measures to manage specific Natura habitats within that system (for example seasonally grazed semi-natural habitats, hay meadows or fallow land) are likely to fail if the relationship with the rest of the farm is not taken into account when setting objectives and planning management measures.

This is a particular risk if the farming system as a whole is uneconomic, where supporting the management of only one part may not prevent abandonment or intensification of the system as a whole. Some livestock farming systems are highly adapted to specific habitats,

for example pastoral systems with transhumance, common land, or short-term grazing by the flocks of landless graziers.

When both stages are complete it will be possible to identify the full extent of the farmland, farms and farmers that will need to be taken into consideration when deciding which conservation measures are needed to achieve the site's conservation objectives. That is why it is important, at this stage, to also collect as much information as possible about all relevant stakeholders that should be involved or consulted in the management planning process.

- **Identifying targets for key farmland habitats and species**

Member States have a clear responsibility under the Birds and Habitats Directives to ensure all habitats and species of Community interest are maintained or restored to Favourable Conservation Status (see section 3.1 above). However, in practice it is necessary to consider which habitats and species may need most urgent and extensive conservation measures to achieve this.

Therefore, in the context of these guidelines on farmland habitats and species, it is important that Member States review the status of their key farmland habitats and species, on a national, regional and biogeographical basis as appropriate. Key farmland habitats and species (as defined in Chapter 2) should be the initial focus of this assessment, although in some countries other habitats and species of Community interest might also have important relationships with farming, and might therefore also be worthy of consideration.

It is suggested that prioritisation and target setting for each key farmland habitats and species should take into account the following attributes of particular conservation importance:

- The proportion of the habitat area / or species population that has an unfavourable conservation status at an EU, biogeographic and national level<sup>20</sup>
- The proportion of the total EU and/or biogeographic habitat area or species' population that occurs within the Member State (see Annex C for indicative current estimates of key agricultural habitats in each Member State)
- The proportion of the habitat area or species' population that occurs within Natura 2000 sites within the Member State

Once the status of the key habitats and species have all been assessed then it is useful to consider setting targets for their conservation within each Natura 2000 site. For example, targets could be set to increase (ie restore or re-create) habitats or species populations that are too small (and/or fragmented) to be viable in the long-term. For other less threatened habitats it might be appropriate to have a target that aims to maintain certain percentage of them (eg to maintain 95% in Favourable conservation status).

It is important to note that target setting should also take into account practical considerations, such as the ecological feasibility of restoring habitats as well as additional

---

<sup>20</sup> This should be based on the most up to date Article 17 assessments, and give special attention to the proportion that is assessed as being in 'unfavourable – bad condition'

benefits from ecosystem services that may be obtained (e.g. increasing carbon storage, water resource and flood management, and recreation and landscape protection benefits). Such additional benefits might increase local community support for conservation actions, and create opportunities for alternative sources of funding.

- **Assessing pressures and potential impact on conservation status**

Having identified the areas of farmland and set targets for key farmland habitats and species within Natura 2000, the next step is to identify the drivers and pressures facing the various farming systems upon which the management of Natura 2000 farmland depends. This analysis will help to identify both the farming systems and land threatened by future abandonment or intensification, allowing intervention before it is too late.

Combined with information on targets and priorities for key farmland habitats and species, this will enable managing authorities to set strategic priorities for practical measures to address pressures and achieve conservation targets, through for example developing combined packages of measures that address a number of habitat and species targets.

It is also important to compile the best available information on the status of farmland habitats and species. This requires access to reliable, up-to-date and extensive ecological data (eg inventories, habitat maps and species atlases), and therefore surveys may need to be carried out and records compiled and mapped. Such actions can be costly, however, experience and evidence shows that well researched, designed and targeted measures are more cost-effective overall. Making best use of local, national and international expertise and using available services<sup>21</sup> is helpful in this respect.

- **Setting Natura 2000 site conservation objectives**

As explained above, Member States need to set conservation objectives for each Natura 2000 site. Site-level conservation objectives should define the condition to be achieved for each species and habitat types of EU importance present within that site in order to maximise the contribution of the site to achieving their overall Favourable Conservation Status.

This will involve assessing at the site level the degree to which the Natura habitat or species concerned needs to be maintained at a particular conservation status, or, more often, to be restored to an improved conservation status (see box 3.1). It is important to design clear and accepted conservation objectives, as these are the basis on which the conservation measures should be defined. The conservation objectives can be specified within the site designation decisions or can be further elaborated in the context of site management plans or other instruments.

Site level conservation objectives should be based on the ecological requirements of the Natura 2000 habitat types and species. The ecological requirements involve all the ecological needs of abiotic and biotic factors necessary to ensure the favourable

---

<sup>21</sup> E.g. such as [www.conservationevidence.com](http://www.conservationevidence.com)

conservation status of the habitat types and species, including their relations with the environment (air, water, soil, vegetation, etc.).

These requirements rest on scientific knowledge and can only be defined on a case-by-case basis, as they will vary from one species to another but also for the same species from one site to another. They should reflect the importance of the site for the maintenance or restoration, at a favourable conservation status, of the habitat types and species present on the site and for the coherence of the Natura 2000 Network.

Conservation objectives should also address the threats of degradation or destruction to which the habitats and species on the site are exposed. Adequate baseline information is needed to set site-specific conservation objectives.

**Box 3.1 How can conservation objectives be set for farmland areas in Natura 2000?**

*When setting site-specific conservation objectives, it may be useful to consider the parameters that are used to assess the conservation status of habitats and species of EU interest (as part of the Habitats Directive Article 17 reporting process). As regards the habitats, these parameters include the range, the area covered by the habitat type within its range, as well as the specific structure and functions (including typical species) in the habitat. For the species, the range, the population and habitat area are considered. Some examples of attributes that may be considered in the definition of conservation objectives are presented below:*

- *Habitat area: The area occupied by the target habitats should be stable or increasing (overall target areas can be set).*
- *Habitat structure and function: The communities of target habitats should be stable in distribution and composition. Habitat functions and the ecological parameters on which the habitat persistence depends are maintained.*
- *Species abundance and distribution, population structure, etc.: Species populations are stable or increase (target numbers can be set). Population trends are improving. Species distribution, including vital areas and connectivity, is maintained or improved (e.g. through habitat improvement and re-colonisation of improved areas). Population structure is conserved.*

- **Communicating the objectives of Natura 2000**

Farmers and the wider public will not be convinced of the need for farmland management for Natura 2000 unless they can understand the need for conservation measures and how setting conservation objectives for their farmland within their Natura site can play an important role in achieving national and regional targets.

Member States therefore need to engage in a dialogue with stakeholders, particularly the local land managers, and provide easily accessible information on strategic targets and conservation objectives in relation to agricultural habitats and species. They also need to ensure that conservation objectives can be presented in ways that are relevant and easily understandable to farmers and land managers. This is important to enable a two-way discussion with the authorities about how their farmland management can contribute to the conservation of the Natura 2000 site. Farmers may have a very good understanding of previous land management that has led to conservation successes or failures.

### **Box 3.2 Some examples of site-specific conservation objectives**

Some specific conservation objectives for Natura 2000 sites hosting dry farmland and steppe bird communities in Spain include:

- Maintain and recover suitable habitat in quality and extent for different species of steppe birds of Community interest, taking into account their particular ecological requirements.
- Reduce threatening factors and pressures on bird species of Community interest linked to agricultural and other human activities in the site.
- Minimize the impact on birds of some mechanical work, mainly those related to cereal crops.
- Increase the quantity and quality of fallow land and ensure its proper management.
- Conserve and restore the quantity and quality of hedges and areas of natural vegetation associated with agricultural plots.
- Protect the vegetation associated with small seasonal streams.
- Promote the maintenance of agricultural landscape mosaic, which is facilitated by the rotational crops used in traditional extensive agriculture.
- Develop a more efficient system of integrated production with more stable yields and lower costs.
- Promote extensive livestock farming to maintain natural grasslands in certain areas.
- Promote pasture improvement through seeding adequate mixture of different local varieties of suitable species.

This is a non-exhaustive list of the type of objectives that can be set in Natura 2000 steppe and dry farmland areas. The formulation here presented is rather general, but in site-specific conservation objectives the habitats, species, surface areas, population numbers and other relevant parameters are specified in more detail.

*Source: Several management plans for Natura 2000 sites hosting dry farmland and steppe birds in Spain.*

#### **• Establishing the necessary conservation measures**

Conservation measures are the practical actions that need to be put in place in order to achieve the site's conservation objectives. They must correspond to the ecological requirements of the habitats and species for which the site is designated and take account of economic, social and cultural requirements, as well as regional and local characteristics (Article 2.3).

Conservation measures can include both site-specific measures (ie management actions and/or management restrictions), and horizontal measures that apply to many Natura 2000 sites over a larger area (eg measures to reduce nitrate pollution or to regulate hunting or resource use). Appropriate instruments for implementing these conservation measures can include management plans specifically designed for the sites or integrated into other development plans, and/or appropriate statutory, administrative or contractual measures.

**Management plans** for Natura 2000 sites are widely used in the EU countries, but other measures are also successfully applied and in many countries different options are used in combination for management of Natura 2000 sites. Many Member States use site-specific management plans to guide managers and other interested parties for dealing with the conservation of the Natura 2000 sites through different measures.

In general management plans at site level are used to formulate the objectives together with the measures necessary to attain these objectives. Management plans can also function as a tool to lay down the responsibilities of the socio-economic stakeholders, authorities and NGOs for the implementation of management, to establish the allowed activities and identify potential threats from certain activities on the sites' qualifying interests.

Furthermore, national, regional or European conservation action plans for certain species or habitats (also sometimes referred to a species action plans) can also be used to guide the necessary conservation measures to be implemented on each site. These can propose and define conservation measures in different sites and locations and serve as a tool to implement those measures in particular Natura 2000 sites. Sectoral management plans, e.g. on forestry, agriculture, water, etc., can also set conservation objectives and specific measures for Natura 2000 sites.

**Statutory measures** usually follow a pattern laid down in procedural law and can set specific requirements in relation to activities that can be allowed, restricted or forbidden in Natura 2000 sites. **Administrative measures** can set relevant provisions in relation to the implementation of conservation measures or the authorisation of other activities in Natura 2000 sites.

**Contractual measures** involve setting contracts or agreements usually among managing authorities and land owners or users in the site. Agri-environmental agreements with farmers within the Rural Development Regulation are one example of a voluntary contractual measure aiming at maintaining a favourable conservation status of certain habitat types (eg. meadows, pastures) and species. The complexity of the necessary conservation measures may also require other kinds of contracts and agreements and other types of specific measures, including voluntary conservation management that does not involve any payment or incentive.

In any case, the necessary conservation measures should be designed with sufficient detail to ensure an efficient implementation. The precise location and a description of the means and tools required for their implementation should be provided. An adequate work plan indicating the time of implementation and assigning the roles and responsibilities for those involved in the implementation of the measures should also be provided. The work plan should be flexible enough to allow its review and adaptation when required, eg. on the basis of the actual results of the measures already done.

It is important also to set a timeline to review the conservation measures taken, in terms of their suitability for, and progress towards, achieving the conservation objectives in order to check appropriateness, measurability and implementation.

Compliance with the management plans or established conservation measures in Natura 2000 sites should be ensured when planning for management of farmland in these areas.

Different management approaches are needed in different agricultural conditions e.g. maintenance of existing farming practices may be enough in extensive systems while profound changes may be needed in more intensive farming systems.

Horizontal measures can be suitable for certain habitat types/species across a whole region or country, or to tackle diffuse pressures such as eutrophication from agricultural run-off. In some situations, a few simple requirements that can be applied across the whole farmed landscape may be useful. Measures may also require no action (passive management). Furthermore, these measures may not necessarily be new, as existing measures can also contribute to achieving the conservation objectives.

On the other hand, more specific local approaches may be required in certain areas, including highly tailored and targeted measures that are best suited to the specific management needs of a particular species or habitat in a particular location. It is particularly important to understand the life cycle and ecological requirements of species when designing management measures for particular species. Local conditions can introduce some variation in the specific needs of habitats and species.

It is important to define clearly what, if any, necessary conservation measures are required by law, and specify to whom and to which land these obligations apply. Obligatory land management requirements for farmers are likely to have an impact on the scope to offer incentive payments, because the obligations will form part of the reference level<sup>22</sup> for some payments (for more details see section 5.3).

### 3.3 Identifying the resources needed for managing Natura 2000 sites

It is crucial to identify the financial needs for appropriate management of the Natura 2000 sites in order to optimise their contribution to the conservation of habitats and species of Community interest. The identification of the necessary conservation measures (eg. in management plans and other instruments) is a first step.

In order to ensure a better use of the opportunities available for managing Natura 2000 sites under EU funds, particular attention will need to be paid to more strategic multi-annual planning approach to Natura 2000 financing. The Commission has urged Member States to produce **prioritised action frameworks (PAFs)** for financing Natura 2000, which identify the strategic priorities and the measures to be carried out for the period 2014-2020 as well as the funding instruments that may be used to implement those measures<sup>23</sup>.

---

<sup>22</sup> The reference level defines the dividing line between the level of environmental provision that farmers are expected to deliver at their own expense, and an enhanced level of environmental management for which farmers may be paid to deliver, for example through agri-environment schemes (Kristensen and Primdahl, 2006)

<sup>23</sup> SEC(2011) 1573 final

### **European co-financing**

Opportunities for funding Natura 2000 have been included in each of the relevant EU funds for the 2014-20 financing period<sup>24</sup>. In particular, the Common Agricultural Policy (CAP) has been and will continue being an important financial source. While the main responsibility for financing Natura 2000 lies with the Member States, Article 8 of the Habitats Directive explicitly links the delivery of necessary conservation measures for Natura 2000 to EU co-financing.

The Commission has set out its views on the importance of Union funding for biodiversity and nature protection in the next multiannual financial framework, and stated that this needs a strengthened integrated approach that ensures the integration of the priorities of Natura 2000 action frameworks into the national and regional programmes of EU sectoral funds (European Commission, 2011b)<sup>25</sup>.

The integrated approach was chosen to ensure that the management of the sites is part of wider land and water management policies, to allow Member States to set priorities and to develop policies and measures which reflect their national and regional specificities, and to avoid duplication and overlap of different EU funding instruments and the administrative complication and transaction costs which would be associated with such duplication.

The Commission has also declared its intention to promote the use of innovative approaches and market-based instruments including private funding to support Natura 2000 management, although it recognises that these sources are likely to account for only a small proportion of the overall funding of the Natura 2000 network in the nearer future, and core public funding from the EU and Member States will continue to be required to deliver the conservation benefits of the network.

Prioritised action frameworks serve as strategic planning tools to strengthen the integration of Natura 2000 financing into relevant EU financial instruments for the next programming period. It will be necessary to integrate the results of the strategic planning into the relevant operational programmes of the different funding instruments.

### **Ensuring sufficient funding for implementation**

Although a range of EU policy instruments potentially provide funding for Natura 2000 management, in practice not enough funding is being allocated or accessed by Member States: it is estimated that currently only a fifth or less of the funding that would be necessary is actually being made available (European Commission, 2011; Gantioler et al, 2010; Kettunen et al, 2011). A range of constraints, such as limited integration of Natura 2000 into the national funding priorities and lack of sector recognition or stakeholders' capacity, hinder the uptake of opportunities provided by the EU co-financing framework (Kettunen et al, 2011)

---

<sup>24</sup> Cohesion funding in COM (2011) 612 final, COM (2011) 614 final; Common Agricultural Policy in COM (2011) 625 final, COM (2011) 627 final; European maritime and fisheries policy in COM (2011) 804 final; LIFE financial instrument for the environment and climate action in COM (2011) 874 final

<sup>25</sup> European Commission Communication on 'A budget for Europe 2020' COM(2011) 500 final, Part I (and the environment and climate policy fiches COM(2011) 500 final, Part II)

**Box 3.3 *The Prioritized Action Framework, a strategic planning tool for Natura 2000 financing***

Article 8 of the Habitats Directive requires the Commission to adopt a prioritized action framework of measures involving co-financing to be taken in Natura 2000 sites, having regard to the available sources of funding under the relevant Community instruments, and based on the identification of the relevant measures, their costs and the financing, including co-financing, required for their implementation. This will only be possible on the basis of Member States establishing National and/or regional Natura 2000 prioritised action frameworks (PAFs) for the next financing period (2014-2020). Such an approach will provide a clearer framework to set out objectives and priorities, describe the Natura 2000 measures to be financed, identify the potential contribution of each EU fund to the national/regional Natura 2000 network for the next Financial Perspective and set out the prioritised actions to be taken, as well as monitoring and evaluation of the measures supported. The Habitats Committee has developed a uniform format for prioritized action frameworks together with Member States

PAFs are intended as planning tools aimed at identifying key priorities and providing an integrated overview of how to achieve them having regard to different financing instruments. Member States are currently preparing their Prioritized Action Frameworks, which will identify their strategic conservation priorities for Natura 2000 for the period 2014-2020. Member States will then need to specify their financing needs for Natura 2000 under the relevant plans or programmes. To maximise their influence and the prospect of the uptake under the integration approach such action frameworks will need to be established in advance of the finalisation of the agreement of key programmes for agriculture, fisheries and regional development for the next funding period. The objective is to ensure strategic focus on the most important priorities, as well as complementarity and consistency between the information contained in the prioritised action frameworks and the relevant programmes.

Further information: <http://ec.europa.eu/environment/nature/natura2000/financing/>

Member States should set priorities and develop policies and measures which reflect their national and regional specificities. Effective management and restoration of Natura 2000 protected requires a strategic planning that uses the opportunities offered by EU sectoral policies and the relevant funds to provide funding.

Chapter 5 describes the European co-financing opportunities. Recommendations on planning the financing of Natura 2000 farmland management are provided in Chapter 6.

**Further information**

- Guidance by the European Commission on managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission, 2000. [http://ec.europa.eu/environment/nature/natura2000/management/guidance\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm)]
- The European Commission has produced an interpretation note on the definition of Conservation objectives for Natura 2000 sites, and is preparing new guidance on the definition of conservation measures in accordance with Article 6(1). Establishing conservation measures for Natura 2000 sites.

[https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp?FormPrincipal: idcl=FormPrincipal: id3&FormPrincipal SUBMIT=1&id=11a0552c-1dc0-4e00-b9e4-e7c558b9592a&javax.faces.ViewState=rO0ABXVyABNbTGphdmEubGFuZy5PYmpY3Q7kM5YnxBzKWwCAAB4cAAAAAN0AAEzcHQAky9qc3AvZXh0ZW5zaW9uL3dhaS9uYXZpZ2F0aW9uL2NvbnRhaW5lci5qc3A=\]](https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp?FormPrincipal: idcl=FormPrincipal: id3&FormPrincipal SUBMIT=1&id=11a0552c-1dc0-4e00-b9e4-e7c558b9592a&javax.faces.ViewState=rO0ABXVyABNbTGphdmEubGFuZy5PYmpY3Q7kM5YnxBzKWwCAAB4cAAAAAN0AAEzcHQAky9qc3AvZXh0ZW5zaW9uL3dhaS9uYXZpZ2F0aW9uL2NvbnRhaW5lci5qc3A=])

- Financing Natura 2000:  
<http://ec.europa.eu/environment/nature/natura2000/financing/>

## 4. RECOMMENDATIONS FOR AGRICULTURAL MANAGEMENT OF NATURA 2000 HABITATS AND SPECIES

### ***What does this chapter do?***

*This chapter summarises the main management measures needed to maintain in favourable conservation status key agricultural habitats and species in Natura 2000 sites.*

*It provides recommendations on the key aspects to consider in the implementation of suitable agricultural practices that can contribute to the conservation of Natura 2000 habitats and species.*

### **4.1 Habitat management**

Low intensity agricultural management is necessary for the continued existence of the semi-natural habitat types and species identified in this guidance, and for achieving favourable conservation status of key habitats and species linked to agricultural practices in Natura 2000 sites. Restoration actions are also often necessary prior to the re-introduction of suitable long-term management.

These management measures will mostly be implemented by farmers and adequate support should be provided to them. Some farmers are already carrying out good management measures and it is important to recognise and support their role in conserving and managing these habitats. Others will need support to reinstate management on abandoned land or to refrain from intensification of farmland.

This section describes the main agricultural practices that can contribute to suitable management of Natura 2000 habitats and species.

#### ***Grazing***

Most of the habitats considered in this guidance are managed by grazing, which prevents succession to woody shrubs and trees and controls invasive alien species. However, habitats can be degraded by over- or under-grazing, or inappropriate stock types and grazing regimes. The main considerations in grazing management are as follows:

- *Stocking rates/intensity.* For almost all of the key semi-natural habitats, management recommendations require grazing regimes to be extensive, with low to moderate stocking levels. However, a small number require higher grazing rates to maintain their conservation value. Determining specific stocking rates for a habitat type must take into account specific local conditions, including: type and age of vegetation; habitat productivity; soil type; hydrological conditions; the degree of grazing by wild

herbivores; site management history and conservation objectives. A careful balance of stocking rates and length of grazing period should be established to ensure suitable grazing pressure. It is also important to consider the utilisation rate of the stock.

- *Stock types, breeds, and combining grazers.* Different stock species graze in different ways, affecting their suitability for individual habitats. Cattle are non-selective grazers and thus can suppress abundant grass species. Sheep are better suited to nutrient-sensitive habitats, areas susceptible to erosion, where conditions are drier and grassland productivity is lower. Horses and ponies are used less commonly and usually in combination with sheep or cattle. Mixed herds of goats and sheep are beneficial on some habitat types, especially where scrub encroachment has occurred. However, goats should not be used without a shepherd where there exist patches of sensitive habitats. Using a combination of grazers can create a varied sward structure favouring a wide range of species.
- *Seasonality and timing, rotational grazing.* In some alpine and subalpine grasslands, seasonality underpins traditional ‘transhumance’ grazing regimes, in which animals are grazed on the hills during the summer and brought down to valley pastures in winter. Grazing seasonality varies regionally and productivity and soil conditions can support year-round grazing where habitats occur at certain altitudes and latitudes. Although established seasonal patterns of grazing are determined by long-term climatic conditions, it is necessary to adapt management levels year-on-year, as many semi-natural habitats show considerable inter-annual fluctuations in productivity as a result of climate variability. Rotational, rather than continuous, grazing is generally preferable, as it offers the best means of creating a heterogeneous habitat while avoiding excessive damage through trampling and dung fertilisation of single patches. However, it is costly and labour-intensive (requires shepherding or fencing) potentially limiting its practicality. As mentioned earlier, a balance must be found between a long period of relatively low intensity grazing or a shorter higher intensity regime.

### **Shepherding**

For many habitats, particularly in mountainous regions, shepherding is a cultural tradition. Skilled shepherding maintains extensive grazing of open habitats, diverse in space and time, and an optimal intensity for maintenance of vegetation diversity, suitable for both livestock and biodiversity. Shepherds divide large grazing areas into sectors, within which they encourage livestock to graze on the optimum balance of more and less palatable species, in order to ensure a good diet with minimum energy use, whilst simultaneously maintaining the pasture and controlling scrub. Specifically, shepherding benefits biodiversity through:

- Control of scrub and heath
- Maintenance of a mosaic of habitats and habitat edges
- Wildfire control
- Reduction of risk of erosion and desertification
- Supply of livestock carcasses

- Seed dispersal
- Redistribution and concentration of nutrients

Pastoralist and transhumance systems that maintain seasonal grazing on open pastures are being widely abandoned. Current initiatives to support these systems include shepherding schools in France and Spain.

### ***Sheep and cattle folding, location of water and shelter***

In some parts of Europe where shepherds are used, sheep and cattle have been traditionally kept in fenced areas at night for protection from predators. This practice known as folding can create very high grazing pressure over a small area, resulting in intense browsing and trampling, eutrophication and changes in soil properties, which can cause a decline in characteristic species and, often, invasion of alien species. Similarly, the location of water supply and shelter will have an influence on stock behaviour, potentially causing similar problems. Folding is not recommended on natural grasslands or semi-natural dry grasslands. However, it may be permitted in some locations, provided pens are removed each day or livestock density and grazing period are limited.

### ***Controlled burning***

Some grazed natural and semi-natural grasslands, scrublands and heathlands may need careful burning management to prevent establishment of woody species (especially in absence of adequate grazing), reduce litter and release nutrients. Burning can help maintain low nutrient conditions, particularly where atmospheric pollution results in higher than natural nutrient inputs from rainfall. In upland heathlands, such as the moorlands of the UK, controlled burning of small patches is widely carried out to increase the structural diversity of vegetation, by maintaining a presence of all growth phases of the dominant heath species, which will promote invertebrate and bird species richness. However, inappropriate burning management (eg burning large areas, too frequently, the wrong type or age of vegetation, or on peat soils) leads to significant negative impacts.

Therefore if required, burning management must be very carefully planned and controlled (especially if there is a risk of fires getting out of control) and strictly carried out according to national regulations and guidelines, such as those listed at the end of this chapter.

### ***Mowing/hay-cutting***

Many semi-natural grasslands (meadows) are cut for hay to produce forage that can be stored for winter feeding of cattle. Some low productivity grassland types, such as *Molina* meadows, have traditionally been cut late for animal bedding litter. Cutting is non-selective and therefore encourages the growth of grasses and low-growing herbs whilst reducing tall herbs and eliminating woody plants. Removal of the cut grass from the field results in long-term maintenance of low in nutrient levels, resulting in semi-natural meadows with very high plant diversity and of considerable conservation value, both for their plant and associated invertebrate communities.

- *Timing and frequency.* In general, hay meadow habitats should be cut after breeding birds have hatched and plants have set seed, when the grass reaches about 50–120 cm high. Mowing operations should be varied in time and space to create a habitat mosaic, either by leaving areas (10–20% of the habitat) unmown for a year and rotating the unmown plots annually, or by mowing all plots in a year, but mowing different areas at different times. A rotational grassland management program maintains a range of different successional stages, increasing species diversity. Optimal mowing frequency varies among habitat types and sub-types and on a site-by-site basis depending on, eg conservation aims.
- *In-field drying and removal of cut biomass.* In hay meadows, cut hay should be left to dry in the field before collection and stacking to allow seeds to drop and ensure the reproduction of flowering plants. For most of the other mowed habitats, cuttings should be removed as soon as possible, to avoid nutrient enrichment and ‘choking’ of the underlying vegetation.
- *Mowing equipment/machinery.* Traditional low-intensity methods of hay cutting, eg scything, have become uneconomic, but heavy machinery can damage habitats, particularly on waterlogged or loose soils susceptible to erosion and compaction. On wet soils, grass should instead be cut manually, or by using specifically designed machinery. To mitigate direct mortality of meadow fauna species caused by machinery, cutting should be carried out from the middle of the field outwards; the grass should be cut to a height not lower than 10 cm; cutting should take place after 10 am in the morning; and a lower-impact cutter-bar mower should be used. However, in some regions traditional hay cutting practices require that the hay is cut short just above the moss layer, and the timing of cutting can vary.
- *Combining mowing and grazing.* In a number of habitats, grazing is used in combination with cutting, typically after a cut and usually in autumn or, in dry and mild areas, through the winter. Grazing can introduce greater habitat heterogeneity and a more diverse sward than cutting alone, as animals preferentially graze the most nutritious grasses, and trampling creates patches of bare soil. In some cases, mowing can be used to overcome problems from under-grazing, particularly for initial clearance of habitats that have become densely covered in scrub.
- *Substituting grazing for mowing.* This is not recommended, as it is likely to result in changes in the ecological community composition (Dover et al, 2011). However, in some habitats and for many grassland butterfly species, for example, very low intensity grazing can be an appropriate substitute for mowing.

### **Restricted or no fertiliser use – manure and mineral fertilisers**

Almost none of the dry grassland types can tolerate fertilisation, either on-site or in adjacent areas, and many are already adversely affected by eutrophication. Management of these habitats should prioritise the prevention of nutrient input from fertilization, agricultural run-off or inundation with nutrient-rich surface water, and from supplementary feeding of grazing livestock.

Fertilisation of meadows is also generally not recommended, especially not in areas that have not been fertilized previously. Some meadows have traditionally been managed with low inputs of manure to offset the loss of nutrients through hay removal, or fertilised through periodic flooding that brings in nutrient-rich sediment. Nowadays, many meadows are affected by eutrophication, and fertilisation must be strictly controlled or prohibited, both within the habitat and in the surrounding area. However, some mountain and lowland hay meadow types may, under some circumstances, benefit from a small amount of fertilisation to maintain productivity and species diversity. The effect on species diversity needs to be considered before any level of fertilisation is applied, taking into consideration the effects of eutrophication. An integrated multi-taxa approach to management is recommended to determine the minimal detrimental impact on species richness and diversity in such meadows.

### **More intensive restoration measures including habitat re-creation**

In areas where farmland habitats are damaged by pressures from intensive agriculture, substantial restoration measures may be needed to achieve favourable conservation status for key Natura 2000 habitats and species. Restoration actions may involve:

- *Reversing soil enrichment and re-introducing vegetation.* Where habitats have been damaged by agricultural intensification, including drainage and fertilisation, these must be restored by reducing soil fertility, through cessation of fertilisation and in some cases removal of nutrients. This may include removal of nutrient enriched top soil or several years of cultivation and removal of nutrient greedy crops.
- *Reseeding to restore plant species diversity.* This may be achieved by spreading hay from suitable grasslands (green or dried hay), or acquiring seed of specified plant varieties and oversowing this on bare ground in summer, bedding it in with a roller, or sowing it into the sward using a slot-seeder. Sometimes it may be necessary to prepare the seed bed by ploughing or discing part of the grassland turf.
- *Controlling scrub.* Abandoned or under-grazed semi-natural habitats can be restored by removing scrub, before reintroducing mowing and/or grazing management.
- *Controlling invasive weeds and alien species.* Invasive alien shrub and tree species must be cut and the stumps removed or treated to prevent regeneration. Weeds can be chain harrowed, cut or topped before they flower, but not during the bird nesting season. Grazing from late winter to early spring can help control some perennial weeds, while intensive trampling by livestock can help control bracken (*Pteridium aquilinum*).
- *Maintaining trees in wood pastures: pollarding, coppicing, rejuvenation.* In under-grazed and overgrown wood pastures, encroachment can have detrimental effects on veteran trees (ie large, old and hollow trees) and growth should be thinned out from around these. Some trees can be allowed to mature and split, thus increasing structural habitat diversity. In the *dehesas* and *montados* of Spain and Portugal, oak regrowth must be protected and encouraged through replanting, protection of young trees from grazing, and rotation of grazing.

### **Restoring hydrological management**

Some key semi-natural habitats occur in wetland regions with high water-tables or periodic inundation, and depend on the continuation of historical hydrological regimes. These have often been altered for flood management or to permit alternative land uses or development. Where possible, management should include reversal of such modifications. Strategies to restore hydrological regimes should be designed to mimic natural hydrological functions, including use of the same water source.

- *Managing hydrological units.* Management should be undertaken at the scale of individual hydrological units, if they can be isolated as such, as well as at the level of the whole hydrological system. Consequently, hydrological management requires good knowledge of the system, and only undertaken if adverse effects on adjacent habitats or nearby infrastructure can be avoided.
- *Reversing drainage.* Existing drainage channels can be blocked by damming with wooden, metal or plastic sheets or by infilling with a 'plug' of soil and vegetation to retain water. Further drainage should not be permitted.
- *Restoring ground water levels and regimes.* Several semi-natural habitats (in particular humid grasslands) are very sensitive to changes in groundwater levels. Water tables should be raised by halting groundwater abstraction or, where this is not a viable option, restricting the volume of water that can be removed and the times at which this can occur. In some areas, groundwater may be recharged by constructing downstream dams or sluices to retain water, although there is some risk of undesirable stagnation of water or overtopping of channels with limited infiltration in habitat types with less permeable soils.
- *Flooding and river regulation.* Some important habitats (eg alluvial meadows) depend on regular flooding for supply of nutrients and substrate material. Winter flooding of many floodplain grasslands is also very important for wintering waterbirds (eg ducks, geese and swans) and for creating suitable habitats for breeding waders. In areas where damming is practicable, sluices can be used to keep sites flooded during the winter. Where this is not feasible, a more natural river regime should be restored in other ways (Eriksson, 2008)(Eriksson, 2008)(Eriksson, 2008).
- *Coastal hydrology.* Coastal habitats, including meadows and dune systems, depend on regular disturbance through the action of tides, waves and wind. Managed re-alignment, ie the removal of coastal defences in order to restore natural coastal dynamics, can re-create open habitat, and restore habitat dynamics, providing all potential consequences (eg for sediment regimes, erosion rates along the coast) have been fully considered. In many cases, complete removal of defences will not be possible, but defences can be modified to reinstate a more natural flooding regime. For example, flow-regulating channels and sluice gates can be added to sea walls to allow regulated tidal exchange, which is important for coastal meadows and pastures.

## 4.2 Species management

The measures necessary to maintain and restore favourable conservation status for most key farmland species will be the same or similar to those described in the previous section for key farmland habitats. Key elements include ensuring appropriate grazing rates and seasons, correct timing of hay cutting, maintenance of water levels and flooding regimes in wet grasslands, and avoidance or strict control of fertiliser and pesticide application. Should burning be required for habitat management, careful planning and control are necessary to avoid the breeding season for ground-nesting birds or periods when plants are especially sensitive to fire.

It is beyond the scope of these guidelines to identify the full range of additional actions that may be necessary for all key farmland species. However, some particularly common or important generic actions for species conservation include:

- Ensuring all feeding, breeding and shelter related habitat requirements are provided across all seasons and within the species' home range area, which may require a mosaic of different habitat patches.
- Maintenance of particular habitat features, such as hedges, trees, ditches etc, as described further below.
- Supplementary feeding for some species with particular requirements that cannot be easily replaced (eg carcasses for vultures).
- Modification of farming practices, such as mowing and grazing density and timing, to avoid or reduce mortality and disturbance of vulnerable species (eg ground-nesting birds).
- Control or eradication of alien species that compete with or predate native species of conservation importance.

Conservation measures require good knowledge of species ecology, life-cycle and site-specific condition and requirements. Agri-environment measures should include tailored measures, which must be spatially targeted for effectiveness and efficiency (see Chapter 6). It is important to note that many species of community interest are also dependent on habitats outside Natura 2000 designated sites.

### ***Key measures to conserve species on arable land***

Some of the most threatened species listed on the Habitats and Birds Directives are dependent on extensive management of arable land. Key management measures include:

- low input cultivation: low fertiliser use, no or little irrigation, and use of crop varieties suited to low productivity environments;
- no pesticide application;

- no deep ploughing on arable land on sandy soils where Common Spadefoot Toad (*Pelobates fuscus*) is present, or on loamy soils where the hamster species (*Cricetus cricetus* or *Mesocricetus newtoni*) are present;
- summer cereal cultivation with long stubble period and maintenance of fallow areas;
- mixing and alternating arable and grassland crop areas;
- patches or strips of crops for foraging and/or shelter eg green fodder, bird seed;
- adapting crop harvesting methods to species needs, eg leave uncut strips or patches as refuges, use a cutter bar mower, use a chain bar in front of the mower to warn animals, avoid conditioning hay (crushing newly cut grass to make it dry faster);
- marking of fences (eg with reflective shapes) to prevent collisions by large birds, e.g. Great Bustard (*Otis tarda*)
- creation of nesting plots or refuge strips.

### **Key measures to conserve species on intensively managed agricultural land**

Some key species, particularly geese and other water birds, and the European hamster, are found on intensively managed agricultural land. Measures for these species tend to be variable and species specific but examples include:

- management of grazing damage by geese and other water birds (mainly in winter) by providing sacrificial crops or crop residues (with compensation to farmers) in undisturbed areas
- protection of breeding birds from farm operations by marking nests
- restricting pesticide use to maintain invertebrate populations, especially in field margins
- maintenance of groundwater levels, winter flooding, and/or soil structure to ensure good soil penetrability for foraging birds
- measures for the European hamster (*Cricetus cricetus*) – maintenance of green fodder areas, sacrificial cereal strips, no deep ploughing to prevent burrow damage (see Netherlands case study).

### **Protecting, maintaining and restoring farmland habitats for species**

Farmland habitats such as hedges, dry stone walls, ponds and terraces are key habitats for species associated with extensive agriculture. Traditionally managed permanent crops, including vines, orchards, olive groves, and nut groves, are important habitats for a range of birds, mammals, reptiles, amphibians and invertebrates of community interest. The crops themselves (especially old trees), and also the extensively managed grassland and other associated habitats, provide nesting and foraging sites (see Italy case study).

Key farmland habitats and features that require preservation and maintenance include:

- hedgerows, copses or small woodlands, single trees and bushes in fields – may need protection against grazing and browsing, trimming and pruning, and replacement planting to maintain continuity;
- trees and bushes traditionally used for pollarding and coppicing should be maintained in traditional ways, and if necessary replanted to ensure the continuity of habitat; large veteran trees in agricultural areas need to be preserved by careful management and removal of competing vegetation, replanting as necessary to maintain continuity;
- farmland ponds and ditches – should be regularly dredged, vegetation controlled, protected from pollution and prevented from drying out, and new ponds should be frequently created;
- dry stone walls and stone terraces – must be preserved and maintained;
- field margins and buffer strips – must be maintained by mowing, and kept free of pesticides and herbicides;
- orchards, olive groves, nut groves with old mature trees – should be supported, regularly pruned, replanted, and kept free of pesticides;
- farm buildings, cellars and caves – are used as hibernation, roosting and breeding sites for bats, birds, reptiles, etc. and should be protected from disturbance.

### *Maintaining viable populations and meta-populations*

Habitat patches must be sufficiently large to maintain viable populations, or sufficiently connected to support meta-populations<sup>26</sup>. This is important for large species that require large areas of habitat (such as many birds of prey and large carnivores), especially in fragmented landscapes. Species that are rare due to the absence of appropriate habitat will benefit most from restoration of suitable habitats and appropriate management, and can be reintroduced where they have disappeared. On the other hand, species that are rare primarily for natural reasons should be conserved by protecting the sites where they already occur, for example in botanical ‘micro-reserves’.

Where populations are not viable in the long-term, conservation actions should be focussed on targeted locations. The area and/or quality of suitable habitat should be increased before increasing connectivity. Habitat restoration actions may be needed for long-term maintenance of existing populations. Where connectivity is needed, “stepping stones” should be created and major barriers such as roads and railways should be bridged. Forests and arable fields can also be effective barriers for grassland species, and open grassy hedge margins, roadside and railway verges may provide essential corridors linking meta-populations, provided they are managed appropriately.

---

<sup>26</sup> A meta-population is a set of populations of one species, which exists in a fragmented landscape, distributed over a number of habitat patches linked together by dispersing individuals. Dispersal depends on the distance between patches and the quality of the intervening landscapes (barriers, corridors, etc.) and influences local extinction and recolonisation rates, which in turn determine the viability of the meta-population.

### 4.3 Key considerations for planning the management of Natura 2000 farmland

Effective management of farmland habitats needs to consider the following key factors:

- **Clear locally tailored conservation objectives** - For measures to be effective, the conservation objectives for each site must be clear and understandable, so that the management measures can be clearly related to the objectives. Where objectives are clearly articulated, generally appropriate management measures can be identified to address these objectives, which makes it much easier to translate into effective implementation on the ground (Polakova et al. 2011).
- **Locally adapted management** - Agricultural measures must be tailored and targeted in order to be effective. The optimum regime can vary considerably between habitat sub-types and on a site-by-site basis, depending on factors such as soil, vegetation, altitude, climate, and management history. It is important to consider site-specific management history, as habitats will often have adapted to and depend on the continuation of traditional regimes.
- **Using best available knowledge** - Management planning should make use of both expert conservation knowledge and local farming knowledge. It is crucial to **learn from best management practices** and from best scientific evidence by consulting conservation experts and managers both in the country and internationally. It is important to **consider traditional knowledge and practice** where it has proved to be effective in preserving habitat quality.
- **Restoration actions** are often necessary prior to the re-introduction of suitable long-term management.
- **Conservation trade-offs** - A balance of conservation measures and clear conservation objectives are necessary, as different species within a habitat will respond differently to management actions. Appropriate management strategies should either maximise the benefits to all species or favour sensitive or priority species, as defined by the conservation objectives.
- **Adaptive management and innovation** - Some experimentation is often necessary to identify the optimal management strategy for a specific site, particularly during habitat restoration. This requires careful planning of appropriate actions and close monitoring of their impacts so that further adjustments are made as necessary.
- **Habitat diversity and heterogeneity** - The complex structure of some key habitats underpins their species richness. To maintain heterogeneity, management type and intensity within these habitats must be varied and edge habitats maintained.
- **Landscape-scale interventions** - The scale at which conservation measures are implemented will affect their effectiveness. They must be targeted to a sufficiently large area to maintain or restore ecologically viable areas of suitable habitat or maintain minimum viable populations of species.

### Further information

Annex D describes more specifically the main management measures needed to restore and maintain each of the key Annex I habitats dependent on agricultural management. Further literature on habitat management recommendations and guidance is also provided.

Management recommendations for some habitat types dependent on agricultural management are also provided in the Commission web site on Natura 2000 management. [http://ec.europa.eu/environment/nature/natura2000/management/habitats/models\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/management/habitats/models_en.htm)

Management recommendations for some species are provided in the reports from the Wildlife and Sustainable Farming Initiative (2007-2009), which describe how the conservation of certain wildlife species protected under the Habitats and Birds Directives can be supported through the Rural Development Programmes (2007-2013). [http://ec.europa.eu/environment/nature/natura2000/management/best\\_practice\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/management/best_practice_en.htm)  
[http://ec.europa.eu/environment/nature/natura2000/management/docs/species\\_report.pdf](http://ec.europa.eu/environment/nature/natura2000/management/docs/species_report.pdf)

## 5. THE CAP AND OTHER SOURCES OF FUNDING FOR NATURA 2000 FARMING SYSTEMS

### ***What can you find in this chapter?***

*This chapter describes the most relevant measures to farmland management in Natura 2000 under the CAP. The review is based on the evidence of how Member States have used CAP measures in the current funding period (2007-2013), but also considers the new opportunities that will be available from 2014, taking into account the European Commission's draft legislative proposals for the future of the CAP.*

*The range of policy instruments that can be used to maintain and restore Natura 2000 farmland management are described in this chapter. These mainly include the instruments under the Common Agricultural Policy, together with some other important EU fund such as the structural funds and the LIFE instrument. This chapter also reviews the potential of market based approaches to support Natura 2000 management through, for example, payments for environmental services (such as water provision) and accreditation and labelling schemes.*

### **5.1 EU funding for Natura 2000 farmland**

This section summarises the main policy and funding instruments that can be used by Member States to maintain or restore the farming systems and agricultural management required for the conservation of Natura 2000 farmland sites and species. Table 5.1. identifies the principal sources of EU funding for Natura 2000 farmland, of which by far the most important are the two Common Agricultural Policy Funds.

Planning and prioritising the Natura funding needed and co-ordinating actions within and between the different funding streams is an essential first step, which will take place within the context of many other competing demands for these funds.

The Prioritized Action Frameworks being prepared by Member States will set out the strategic conservation priorities for Natura 2000 for the period 2014-2020 and provide the basis for calculating the type, scale and sources of funding needed to deliver these priorities. A new development for the 2014-2020 programming period is the introduction of the Community Strategic Framework (CSF) to improve the complementarity, coordination and added value of EU expenditure that is the shared responsibility of the EU and Member States for 2014-2020<sup>27</sup>. The proposed Common Provisions Regulation<sup>28</sup> sets out a number

<sup>27</sup> This includes the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF), the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF).

<sup>28</sup> Proposal for a Common Provisions Regulation COM(2012) 496 final, revised version from 11 September 2012

of thematic objectives for all CSF funds which include ‘protecting the environment and promoting resource efficiency’.

Member States will have to set up Partnership Agreements with the European Commission summarizing the Member State’s plans for using all the CSF Funds. Unlike the national strategies, developed for the current (2007-2013) period, the Partnership Agreement will be adopted by the Commission by means of an implementing act within six months of its submission by the Member State. This is important, because it means that the **Partnership Agreement will be a binding document**, with obligations on the part of the Member State. Partnership Agreements are to be submitted to the Commission with the RDPs, once the regulations are adopted<sup>29</sup>.

**Table 5.1. The EU funds that can support Natura 2000 farmland management**

EU Fund	Relevance to Natura 2000 farmland management
<b>CAP Pillar 2</b> European Agricultural Fund for Rural Development ( <b>EAFRD</b> )	Key source of funding to support conservation management of Natura 2000 farmland and the sustainable socio-economic development of the Natura 2000 farming systems and associated local communities.
<b>CAP Pillar 1</b> European Agricultural Guarantee Fund ( <b>EAGF</b> )	Important source of income support payments for Natura 2000 farmers
<b>European Regional Development Fund (ERDF)</b>  <b>European Social Fund (ESF)</b>  <b>Cohesion Fund (CF)</b>	Relevant only within the broader context of sustainable socio-economic development of the region. The ERDF is generally aimed at strengthening competitiveness and innovation, creating jobs and promoting environmentally sound growth.  The ESF focuses on promoting social inclusion, education and training, and capacity building.
<b>LIFE+</b>	Locally important funding for innovative and demonstration land management projects, but not a source of ongoing management funding. LIFE+ is highly selective and only for activities that are not eligible for other Community funding.

<sup>29</sup> The Partnership Agreement should be in place by 1 January 2014 but this may be delayed if the regulation adoption process extends into the latter part of 2013.

The Commission has provided the basis to ensure adequate EU financing opportunities for Natura 2000 for the next financing period, but increasing the current level of allocation and uptake of available funds to meet the shortfall (described in section 3.3) depends almost entirely on decisions that will be made by Member States. The new programming tools of PAFs, CSF and Partnership Contracts combined offer Member States the opportunity to secure sufficient support for Natura 2000 farmland management in the key funding programmes, particularly the CAP, if they act quickly.

## **5.2 The importance of supporting the farming system not just the land management**

Many Natura 2000 farming systems are under threat. These farmers, who deliver the essential management of key habitats and species, often farm under difficult circumstances using labour-intensive systems on marginal land. They are extremely vulnerable to economic pressures to abandon their traditional farming systems and in some cases to cease production altogether.

Extensive livestock systems are under particular pressure and some grassland is now mown rather than grazed, which can have detrimental impacts on the biodiversity of habitat types that traditionally have been grazed. For example, in Estonia, France, Germany, and the Czech Republic, farmers are cutting or crushing grass and leaving the cut grass to mulch, reducing plant species diversity by smothering the regrowth (King, 2010). Farmers may also cut the grass during the flowering period. The alternative decision to move to more intensive production systems may be equally damaging if housed livestock no longer use summer pastures, and hay meadows are converted to silage production.

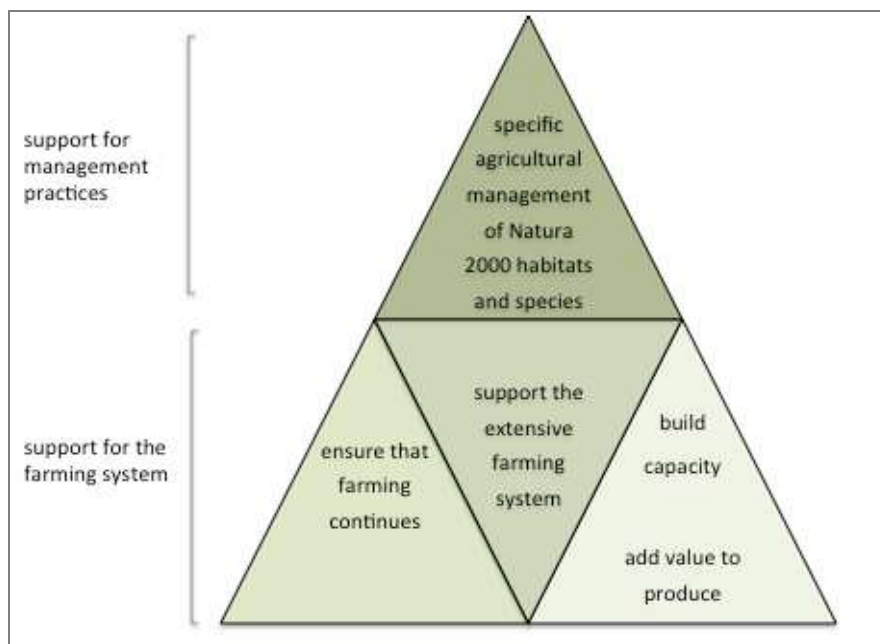
If the Natura 2000 farming system as a whole is uneconomic, simply providing support for the management of specific habitats and features may not be sufficient to ensure that these practices continue.

It is therefore important to build an integrated package of support for Natura 2000 farmers that first ensures the economic viability of the extensive farming system on which the beneficial management depends, and secondly addresses the specific management practices needed for the conservation of the key habitats and species.

The first priority is to address the key threats of abandonment and intensification by ensuring that the farmer can continue (or resume) farming the land, and that the extensive farming system survives. The overall aim is to ensure the farming system is economically viable and support targeted at building the capacity of the farm infrastructure (and the farmer) and improving market income can help to achieve this aim.

In cases where the Natura 2000 land is only part of the farm holding (for example alpine summer pastures) it will be necessary to consider the farm as a whole, including the land outside the Natura 2000. When the underlying support for the farming system is in place then the support for the specific Natura 2000 habitat and species management practices will complete the package. This integrated package of support (Figure 5.1) can be built up using a wide range of measures from both Pillars of the CAP, as explained in sections 5.3 to 5.9.

**Figure 5.1. Building an integrated package of support for Natura 2000 farming systems**



### 5.3 Introduction to the reformed CAP as a key source of funding for Natura 2000 farmland from 2014

The CAP is divided into two 'pillars' that differ in terms of financing, functioning and structure. Pillar 1 is financed fully from the EAGF and provides income support to farmers in the form of direct payments (and also funds other measures such as market interventions and export refunds). Pillar 2 and is co-financed jointly by the EAFRD and Member States and offers a wide range of measures to support farmers and other land managers and rural communities through the multi-annual Rural Development Programmes (RDP) prepared by national or regional administrations. Preparations have already begun for the next RDP programme period is 2014-20, although the new EAFRD Regulations are not yet in place.

In October 2011 the European Commission published the draft legislative proposals for the reformed CAP after 2013. The proposed new regulations signify major changes in the status quo for many of the support measures relevant to Natura 2000 farming including Pillar 1 direct payments under the EAGF, Rural Development measures under the EAFRD as well as the cross compliance framework and requirements for monitoring and evaluation.

**Important note:** *Although the legislative proposals for CAP reform were published on 12 October 2011, agreement on the final version of the legislation is not expected until sometime during 2013, with the new Regulations coming into force from 1 Jan 2014. This guidance is based on proposals in COM(2011)627 final/3, COM(2011)628/3 and COM(2011)625 final/3 but it is important to note that the final legal texts may differ, and that much of the detail will be in implementing regulations not yet published at the time of writing this guidance.*

### ***Proposed changes to Pillar 1 income support payments to farmers***

The focus of Pillar 1 continues to be the provision of decoupled income support payments to farmers, but the structure and range of payments has changed considerably, with simplified requirements and improved access to direct payments for small farms and an option to provide additional payments for marginal farms and for farming systems of particular environmental importance.

Under the proposed legislation<sup>30</sup> Member States would be required to introduce:

- a **Basic Payment Scheme (BPS)** together with an associated **‘green’ payment** for specified agricultural practices beneficial to climate change and the environment;
- a **payment for young farmers**; and
- a **Small Farmers’ Scheme** providing a standard payment of between €500-1000 (with no cross-compliance requirements) to any farmer who wished to apply.

Member States would choose to make two additional types of payment if they wish:

- a per hectare payment to farmers in **areas facing natural constraints**; and
- **coupled** payments (to area, yield or number of animals) **‘where specific types of farming or specific agricultural sectors undergo certain difficulties and are particularly important for economic and/or social and/or environmental reasons’**

All these payments will be area based (except some of the coupled payments) and in future will be allocated as a uniform payment per hectare, moving away from historic farm-by-farm payments that were based on subsidies received in a particular reference year. This will affect the majority of EU-15 Member States and will inevitably lead to some redistribution of payments between land managers. Payment levels can be set at either the national or regional level, with flexibility to define regions in terms of a range of criteria, including *‘agronomic and economic characteristics and their regional agricultural potential, or their institutional or administrative structure’*. Only *‘active farmers’* will be eligible for payments, but meeting this definition<sup>31</sup> should not be a problem for Natura 2000 farmers. (The proposed changes to the cross-compliance framework are discussed in section 5.4 below).

### ***Proposed changes to Pillar 2 - a new thematic structure for the 2014-2020 RDPs***

The changes to Pillar 2 in the proposed legislation<sup>32</sup> relate mainly to the architecture of the regulation and hence to the structure of the 2014-20 Rural Development Programmes (RDPs). The three axes characterising current rural development policy have been replaced

---

<sup>30</sup> European Commission (2011), Proposal for a Regulation of the European Parliament and of the Council establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy, COM(2011) 625 final/3, 2011/0280(COD)

(<http://ec.europa.eu/agriculture/cap-post-2013/legal-proposals/>)

<sup>31</sup> COM(2011)625 final/3, Article 9

<sup>32</sup> European Commission (2011), Proposal for a Regulation of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD), COM(2011) 627 final/3, 2011/0282(COD)

by six priorities, reflecting the thematic objectives of the five funds within the CSF (of which EAFRD is a one):

1. Fostering knowledge transfer and innovation;
2. Enhancing competitiveness;
3. Food chain organisation and risk management;
4. Restoring, preserving and enhancing ecosystems dependent on agriculture and forestry;
5. Promoting resource efficiency and transition to a low carbon economy; and
6. Promoting social inclusion, poverty reduction and economic development of rural areas

Each of these priorities specifies several focus areas, and one of the three within the ecosystems priority specifically refers to ‘restoring and preserving biodiversity, including in Natura 2000 areas and high nature value farming, and the state of European landscapes’<sup>33</sup>.

Member States can create thematic sub-programmes within their RDPs, showing how they will use the measures available to contribute to these priorities and to address specific needs in their national or regional contexts. The proposed regulation identifies the needs of young farmers, small farms, mountain areas and short supply chains as topics for thematic sub-programmes and allows Member States to raise the maximum rate of support for operations within these sub-programmes.

Other relevant changes to the current EAFRD include broadening of the scope of the agri-environment measure by renaming it ‘agri-environment-climate’; recognition of the benefits of collaborative action at the landscape scale, through higher transaction costs permitted within the payment calculation for management contracts involving more than one land manager; and extending the scope of the Natura 2000 compensation measure to cover farmland in other nature protection areas, with environmental restrictions which contribute to Article 10 of the Habitats Directive.

### ***Potential synergies between Pillars 1 and 2 support for Natura 2000 farmers***

The two pillars of the CAP have different purposes but it is important that at farm level the potential synergies between them are used to support both Natura 2000 farming systems and management practices. It is important to consider the local conditions and to analyse which measures are best adapted to support the conservation objectives in each area. It is also very important to combine the different measures so as to ensure that sufficient support is provided to extensive and HNV farming systems. Pillar 1 payments are often needed alongside Pillar 2 agri-environment management payments if farming is to be maintained in areas with extensively managed semi-natural habitats (Oñate et al, 2007; Poláková et al, 2011). Although Pillar 2 is currently the main source of EU funding for specific nature conservation management of farmland, the extent and targeting of support for Natura 2000 farmland varies greatly between Member States. In the 2014-20 such funding increasingly will have to compete with many other rural development priorities at Member

---

<sup>33</sup> COM(2011) 627 final/3 Article 5

State or regional level, and it is more important than ever to build coherent packages of Natura 2000 farmland support using funds from *both* Pillars of the CAP.

#### 5.4 The reference level for CAP payments and the eligibility of Natura 2000 farmland

##### *Cross-compliance and other requirements*

The concept of the 'reference level' as applied to farm payments under both Pillars of the CAP is a cost allocation mechanism to define the dividing line between the level of environmental provision that farmers are expected to deliver at their own expense, and an enhanced level of environmental management for which farmers may be paid to deliver, for example through agri-environment schemes.

The environmental reference level for area-based payments on farmland under the CAP consists of CAP cross-compliance and other standards that include:

- relevant Statutory Management Requirements (SMR), for example elements of the Habitats or Birds Directives relating to farm level protection of Natura 2000 habitats and species;
- standards for Good Agricultural and Environmental Condition (GAEC) as defined by Member States within a common EU framework;
- other national or regional regulations that apply at farm level, whether or not the farmer receives CAP payments;
- Pillar 1 'green' requirements (for recipients of these payments and of agri-environment-climate and other area-based EAFRD payments)
- (for recipients of agri-environment-climate payments only) requirements on the use of fertilisers and plant protection products which Member States must define in the RDP<sup>34</sup>.

Member States define their own verifiable GAEC standards for farmland, within a framework provided by the legislation, and in doing so they must take into account *'the specific characteristics of the areas concerned, including soil and climatic condition, existing farming systems, land use, crop rotation, farming practices and farm structures'*<sup>35</sup>. This provides scope for Member States to define specific GAEC standards for HNV and Natura 2000 farmland, and Bulgaria has already done this<sup>36</sup>.

---

<sup>34</sup> COM(2011) 627 final/3 Article 29(3)

<sup>35</sup> COM(2011) 628/3 Article 93 and Annex II

<sup>36</sup> Bulgaria has large areas of HNV grassland where abandonment is a major environmental problem, and the 2007 GAEC standard (for clearance of unwanted bushes), as originally defined and implemented by the Bulgarian authorities, led to the destruction of valuable semi-natural habitats. In 2010 the GAEC standard was split into two with a new, separate standard introduced specifically for HNV farmland, Natura 2000 and other protected areas (Keenleyside et al 2012).

**Table 5.1 Proposed cross-compliance requirements for environment, climate change, good agricultural condition from 2014** (Source: COM(2011) 628/3 Annex II. The final legal text may differ)

Area	Main Issue	Requirements and standards		
Environment, climate change, good agricultural condition of land	Water	SMR 1	Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (OJ L 375, 31.12.1991, p. 1)	Articles 4 and 5
		GAEC 1	Establishment of buffer strips along water courses <sup>a</sup>	
		GAEC 2	Where use of water for irrigation is subject to authorisation, compliance with authorization procedures	
		GAEC 3	Protection of ground water against pollution: prohibition of direct discharge into groundwater and measures to prevent indirect pollution of groundwater through discharge on the ground and percolation through the soil of dangerous substances, as listed in the Annex to the Directive 80/68/EEC	
	Soil and carbon stock	GAEC 4	Minimum soil cover	
		GAEC 5	Minimum land management reflecting site specific conditions to limit erosion	
		GAEC 6	Maintenance of soil organic matter level including ban on burning arable stubble	
		GAEC 7	Protection of wetland and carbon rich soils including a ban of first ploughing <sup>b</sup>	
	Biodiversity	SMR 2	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ L 20, 26.1.2010, p. 7)	Article 3(1), Article 3(2)(b), Article 4 (1), (2) and (4)
		SMR 3	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna (OJ L 206, 22.7.1992, p. 7)	Article 6 (1) and (2)
	Landscape, minimum level of maintenance,	GAEC 8	Retention of landscape features, including where appropriate, hedges, ponds, ditches, trees in line, in group or isolated, field margins and terraces, and including a ban on cutting hedges and trees during the bird breeding and rearing season and possible measures for avoiding invasive species and pests.	

<sup>a</sup> The GAEC buffer strips must respect, both within and outside vulnerable zones designated pursuant to Article 3(2) of Directive 91/676/EEC, at least the requirements relating to the conditions for land application of fertiliser near water courses, referred to in point A.4 of Annex II to Directive 91/676/EEC to be applied in accordance with the action programmes of Member States established under Article 5(4) of Directive 91/676/EEC.

<sup>b</sup> Ploughing of wetland and carbon rich land which has been defined in 2011 at the latest as arable land in accordance with Article 2 point (a) of Regulation (EC) No 1120/2009 and which complies with the definition of arable land as laid down in Article 4 point (f) of the Regulation (EU) No DP/xxx shall not be considered as first ploughing.

The legislative proposals for CAP in 2014 have revised cross-compliance requirements. The SMR standards based on the Habitats and Birds Directives remain broadly the same but some changes are proposed for the GAEC framework. The proposed GAEC and SMR standards are organised in four groups comprising environment, climate change, good agricultural condition (shown in Table 5.1.); public, animal and plant health; and animal welfare. The optional GAEC standards have almost all been removed, including that for minimum stocking rates and/or appropriate regimes.

After 2015 there will no longer be a GAEC standard for permanent pasture (but to cover the transition to the Pillar 1 'green' payment, during 2014 and 2015 the current rules on maintenance of the area of permanent pasture will still be part of cross-compliance). The current GAEC standard for the retention of terraces remains, within a revised standard for landscape features that also allows Member States to introduce measures for avoiding invasive species and pests (this appears to have replaced 'avoiding the encroachment of unwanted vegetation' which has been implemented by some Member State in a way that damaged Natura 2000 habitats). The framework been strengthened to reflect the new emphasis on climate priorities by the addition of two new standards; to conserve soil organic matter; and to protect wetland and carbon rich soils, including a ban on first ploughing<sup>37</sup>. The latter could be very important in future for protecting Natura 2000 habitat areas that lie outside designated Natura 2000 sites. For example, in four federal German states more than 6000 ha of fen or bog grassland on peat soils were converted to maize cultivation between 2005 and 2007 (Nitsch et al, 2012).

### **Effect of the proposed 'green' payment under Pillar 1**

The proposed new 'green' payment for agricultural practices beneficial to climate change and the environment comprises three measures with which most farmers must comply:

- **Crop Diversification:** on farms with more than three hectares of arable land (including fallow) three different crops must be grown with no crop covering less than 5 per cent of the area and the main crop covering no more than 70 per cent.
- **Permanent Grassland**<sup>38</sup>: farmers will be required to maintain 95 per cent of the area of permanent grassland on their holding as declared in 2014 (additionally, for 2014 and 2015 the maintenance of permanent grassland will be a cross-compliance requirement<sup>39</sup>);
- **Ecological Focus Areas** – 7 per cent of the area of farmland eligible for the basic payment (but excluding permanent grassland areas) must be managed as ecological focus areas; for example as landscape features, fallow land, terraces, buffer strips and afforested using RDP support.

Organic farmers would automatically qualify for the 'green' payment, farmers in Natura 2000 areas would need to comply only to the extent that the 'green' requirements are

---

<sup>37</sup> COM(2011) 628/3 Annex II

<sup>38</sup> Defined as 'land used to grow grasses or other herbaceous forage naturally (self-seeded) or through cultivation (sown) and that has not been included in the crop rotation of the holding for five years or longer; it may include other species suitable for grazing provided that the grasses and other herbaceous forage remain predominant' COM(2011) 625 final/3 Article 4(h)

<sup>39</sup> COM(2011) 628/3 Article 93

compatible with the Natura 2000 objectives, and recipients of the Small Farmers' Scheme would not be eligible.

The 'green' requirements will have the greatest land management impact on farms with significant areas of arable and permanent crops but comparatively little permanent grassland. Potentially the creation of ecological focus areas (EFAs) on these farms could mean more habitat is available for Natura 2000 species on arable farmland outside Natura 2000 sites, and the habitat value and permeability of intensive arable areas is improved (Dänhardt et al, 2010; Gilbert-Norton et al, 2010; Smith et al, 2010). However, the extent to which additional good quality habitat is actually made available will depend on what proportion of EFA is short-term fallow, what other types of area and feature are protected, whether they are managed for biodiversity, and how they distributed at the local and landscape scale (Allen et al, 2012a).

For Natura 2000 and HNV farmland the most significant impact of the Pillar 1 greening proposal will be its effect of raising the reference level of environmental management expected on EU farms (Allen et al, 2012a). Relevant agri-environment schemes (for example for crop diversification) will have to be adapted to ensure that they do not overlap with the 'green' requirements in Pillar 1 and that payment calculations take account of the raised reference level which will be the new baseline for agri-environment-climate payments.

The proposed 'green' requirements continue to be the subject of debate amongst Member States and European politicians, and the final legal text may differ significantly from the proposals described here. One suggestion which could potentially improve the environmental effectiveness of the permanent grassland requirement would be to define semi-natural pastures separately from agriculturally improved permanent pastures, provided that an acceptable mapping methodology is found<sup>40</sup>. If fully protected from conversion this could be of benefit to key habitats and species outside Natura 2000 areas.

### ***Eligibility of Natura 2000 farmland for CAP payments***

All farmland in Natura 2000 should be eligible for CAP payments under both Pillar 1 and Pillar 2 but in a number of Member States substantial areas of Natura 2000 farmed habitat are currently deemed ineligible for direct payments under Pillar 1. This is the responsibility of the Member States, and eligibility issues are often related to characteristic features of Natura 2000 farmland which are an essential part of their biodiversity value, but do not fit within the Member State's interpretation of the EU eligibility rules. Issues include the presence of trees, shrubs and scrub on pastureland, farm or parcel size, land tenure, outdated land registration records, and difficulties with GAEC standards that Member States have designed for more intensive farming systems. The most serious example is in Bulgaria where 703,384 ha of HNV permanent pastures have been excluded from Pillar 1 support because of decisions by the national authorities (Keenleyside et al, 2012).

Many pastures are most valuable for biodiversity when they consist of mosaics of open grazed grassland with scatterings of shrubs and/or trees or other landscape features such as

---

<sup>40</sup> European Forum for Nature Conservation and Pastoralism (July 2012) response to the Commission Services concept paper on greening of 11 May 2012

patches of unmown grass, walls, rocks, rush or wet areas, or because they are woodland pasture systems (Bergmeier et al, 2012).

In many Member States, large areas of extensive grazing land are classified as forestry land rather than agricultural land. For example, in Spain permanent pastures are mainly classed as “monte” or forest land; over 19 million hectares are used for livestock grazing, mostly as common land (Beaufoy et al, 2011a). The Commission guidance that disallows land with more than 50 trees per ha<sup>41</sup> also causes problems, and this guidance is currently being revised to try to clarify these issues.

The examples in Box 5.1 show how some Member States have excluded key Natura 2000 farmland areas from CAP support and how others have used the scope of the EU rules to ensure that Natura 2000 habitats and farmers are eligible.

Many of the features and areas that Member States currently exclude from the eligible area for Pillar 1 direct payments are considered part of the area eligible for agri-environment payments under Pillar 2. Some agri-environment schemes have been put in place largely as a reaction to the ineligibility of such habitats for direct payments under Pillar 1, for example the schemes designed for wooded semi-natural habitats in Estonia and Sweden, with an important element targeting Natura 2000 sites (King, 2010). This can only be a partial short-term solution, because the agri-environment measure is intended to support very specific environmental management and is not designed to ensure the economic viability of the Natura 2000 farming system. It would be preferable to resolve the eligibility issues and enable farmers in these areas to receive direct payments, preferably by harmonising the definitions of eligible land used in the two Pillars of the CAP.

In some cases Natura 2000 farms have been excluded from support simply because they are smaller than the minimum size set by the national authorities. The draft legislation indicates that farms below a certain size will not be eligible for Pillar 1 direct payments (typically €100 per year or one hectare) but Member States are free to adjust this threshold within defined limits ‘to take account of the structure of their agricultural economies’. For example, the minimum eligible area per holding could be as low as 0.1ha in Malta; 0.3ha in Cyprus, Hungary, Portugal, Romania and Slovenia; 0.4ha in Greece and 0.5ha in Bulgaria, Italy and Poland. Member States could take advantage of this flexibility to ensure that small Natura 2000 farms are eligible for Pillar 1 support<sup>42</sup>.

---

<sup>41</sup> Commission recommendation that a parcel with more than 50 trees per hectare should be considered ineligible ‘as a general rule’

[http://marswiki.jrc.ec.europa.eu/wikicap/index.php/ETS\\_specific\\_inspection\\_examples\\_2011](http://marswiki.jrc.ec.europa.eu/wikicap/index.php/ETS_specific_inspection_examples_2011)

<sup>42</sup> COM(2011) 625 final/3 Article 10 and Annex IV

**BOX 5.1. Examples of Member States interpretation of CAP Pillar 1 eligibility rules**

There are currently major inconsistencies between Member States in the interpretation of Commission guidance on eligibility of land for CAP payments and in the definition GAEC standards, particularly for pastures with shrubs and trees. Some Member States have taken a broad approach favourable to HNV and Natura 2000 farmland by including large areas of actively-farmed pastures with scrub and trees in their eligible areas for Pillar 1 payments. The UK includes most areas of heathland in its LPIS and considers it eligible for Pillar 1 payments so long as the vegetation is not too thick for grazing animals to penetrate (DVL & NABU, 2009). France explicitly allows areas of low productivity as eligible forage if they show a resource of grass, shrubs or fruit (chestnuts, acorns) that are consumable, accessible and actually grazed/browsed by the flock, including extensive and rough grazing, moorland, and woodland (including those with more than 50 trees per hectare) (Beaufoy et al, 2011b). In Spain, there are specific LPIS categories for pasture with scrub and pasture with trees; for example, approximately 40% of all farmland eligible for Pillar 1 support in the region of Castilla y Leon is in one of these two categories (Beaufoy et al, 2011a). In marked contrast, other Member States have excluded large areas of pastures from Pillar 1 payments, with negative impacts on both biodiversity and the viability of these important farming systems.

The current GAEC standard to prevent the ‘encroachment of unwanted vegetation’ has in some places been defined in a way that provides an incentive to clear pastures of patches of shrubs or scrub (Birdlife International, 2009a; Cumulus Consultants, 2011; Hart and Baldock, 2011; King, 2010). In 2009 the managing authority in Bulgaria revealed that 400,836 ha of permanent grasslands previously identified as HNV had failed to meet the requirements for Pillar 1 payments, mainly because their definition of the GAEC standard for protection of permanent pastures required ‘permanent pastures or meadows to be cleared of unwanted bushes’. Farmers started cleaning shrubs and bushes, leading to the destruction of some valuable and protected habitats. This GAEC requirement, combined with the problem of abandoned land (mainly permanent pasture but also arable land) led to large areas being excluded from both SAPS payments and area-based payments under Axis 2 (Keenleyside et al, 2012). In Germany, various grassland and heath areas under nature conservation management have been ineligible for Pillar 1 payments because they are not considered to be under (productive) agricultural management (DVL and NABU, 2009), although this may change as a result of a ruling by the European Court of Justice. In Romania, an estimated 1.9 million small-scale farmers (45% of all holdings) are excluded from SAPS because they farm less than 1 hectare (Redman, 2010). Large areas of unenclosed grazing land (usually common land) are not registered for direct payments (Nori and Gemini, 2011).

Rules on including landscape features such as shrubs, trees or hedges as part of the area eligible for direct payments are also causing problems (DVL & NABU, 2009; Oppermann, 2009). For example, features that are more than 4m wide (or more than 2m wide if internal to the parcel) generally have to be excluded from the eligible area<sup>43</sup>, but Member States do have the option of allowing landscape features, such as hedges of any width, to be counted in a farm’s eligible area if they inform the Commission that such features are explicitly treated as ‘landscape features’ which a farmer must retain under GAEC. Ireland has done this, but many other Member States have not (Beaufoy et al, 2011b), including the UK which excludes a range of environmental features such as hedges from the eligible area. If landscape elements more than 0.1 ha in area are part of the eligible area they are supposed to be mapped and digitalized in the Land Parcel Identification System (LPIS) for control purposes<sup>44</sup>. This is very difficult to do for dynamic features such as shrubs on extensively grazed pastures (DVL & NABU, 2009). Even if the farmers and shepherds try to map them with a lot of effort, their location and/or area may have changed by the time of an audit.

<sup>43</sup> Article 34 of Council Regulation (EC) No 73/2009 of 19 January 2009, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:316:0065:01:EN:HTML>

<sup>44</sup> [http://marswiki.jrc.ec.europa.eu/wikicap/index.php/Area\\_measurement](http://marswiki.jrc.ec.europa.eu/wikicap/index.php/Area_measurement)

In 2010 an important ruling of the European Court of Justice (ECJ) makes clear that Natura 2000 pastureland should be eligible for Pillar 1 payments. The Court rules where the overriding objective is landscape management and nature conservation should not be excluded from Pillar 1 payments if there is an agricultural activity such as sheep grazing<sup>45</sup>. The ECJ ruled that the *'classification as 'arable land' or 'permanent pasture' and, consequently, as 'agricultural area', depends on the actual use of the land in question. Thus, an area must be classified as agricultural where is it used as arable land or permanent pasture [within the meaning of the Regulation]'*. In the current version of the legislation, to which this judgement refers, permanent pasture is defined as *'land used to grow grasses or other herbaceous forage naturally (self-seeded) or through cultivation (sown) and that has not been included in the crop rotation of the holding for five years or longer'*<sup>46</sup>. In the proposed legislation for 2014 this definition is extended to include *'other species suitable for grazing provided that the grasses and other herbaceous forage remain predominant'*<sup>47</sup>. This broader definition means that semi-natural grassland with a low density of scrub and heath could be eligible, although it would still exclude the very extensively managed rough grazing land with predominantly non-herbaceous forage, such as densely vegetated heathland or blanket bog, leaving the managers of large areas of land still used for agriculture with no access to CAP support payments.

### 5.5 CAP support to ensure economic viability of extensive Natura 2000 farming systems

Low and medium intensity grazing systems in the EU are highly dependent on Pillar 1 direct income support payments for their economic viability (Osterburg et al, 2010). In the new Member States these payments play an important role in maintaining agriculture on land that would otherwise have been abandoned. Avoiding abandonment in these areas is particularly important, because these farms still retain the traditional farming knowledge and skills handed down over generations and that are adapted to the local ecosystems. In these situations the cessation of farming would risk an irretrievable loss of such farming skills.

The first critical step in ensuring that farming continues in Natura 2000 areas is to make sure that the eligibility requirements for Pillar 1 payments are adapted to the particular characteristics Natura 2000 farming systems, for example by GAEC standards, farm or parcel size rules. Equally important is ensuring that Natura 2000 farmers have 'payment entitlements', especially if they have never been able to claim direct payments before. In the first year (only) of the new Pillar 1 scheme a Member States must allocate new payment entitlements to active farmers who are were unable to claim SAPS Pillar 1 payments in 2011 because they only had land that did not meet the requirement for 'good agricultural condition' at the time payment entitlements for the current schemes were allocated in 2003<sup>48</sup>. This is an important opportunity to bring currently unsupported Natura 2000 farmland back within the scope of CAP direct payments.

---

<sup>45</sup> European Court of Justice decision in Case (C-61/09).

<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:62009J0061:EN:HTML>

<sup>46</sup> Regulation 796/2004 Article 2 (1) and (2)

<sup>47</sup> COM(2011) 625 final/3 Article 4 (h)

<sup>48</sup> COM(2011)625 final/3 Title III Article 21

When eligibility of the land and the farmer has been assured there are several payments from both Pillars of the CAP which can be used, often in combination, to underpin the economic viability of these farms, including:

- the Basic Payment Scheme and Small Farmers Scheme (Pillar 1)
- Proposed green payments (Pillar 1)
- Payments for areas with natural constraints (Pillar 1 and Pillar 2)
- Payments coupled to Natura 2000 farming systems (Pillar 1)

### **Basic Payment Scheme and Small Farmers Scheme (Pillar 1)**

The Basic Payment Scheme (BPS) is the farm income support payment that replaces the current Single Payment Scheme (SPS) and Single Area Payment Scheme (SAPS). The BPS will be paid at a standard rate per hectare but Member States have the flexibility to set different rates for different regions if these are defined objectively, for example by *'agronomic and economic characteristics and their regional agricultural potential'*<sup>49</sup>.

As an alternative to the BPS, the new Small Farmers Scheme offers a simplified direct payment of between €500 and €1000 per farm per year with no cross-compliance requirements attached, which small farmers may choose instead of all other Pillar 1 payments. It is aimed at simplifying the administrative burden of paying income support to the large number of very small farms in the EU, and national authorities have considerable freedom to set the lower threshold of farm size eligible for support, within limits defined separately for each Member State in the draft regulation<sup>50</sup>. If they use this flexibility to the full, it should help small semi-subsistence Natura 2000 farms to access support, but it is important to note that there will only be one opportunity for farmers to opt for this payment, just a few months after the legislation comes into force<sup>51</sup>.

### **Proposed green payments (Pillar 1)**

Farmers in Natura 2000 areas will only have to comply with the parts of the 'green' requirements are compatible with the Natura 2000 objectives, and recipients of the Small Farmers' Scheme will not be required to comply at all, because they are not eligible for the green payment. In reality most Natura 2000 farms are likely to be compliant with the green requirements already (for details see 5.4 above) but it is essential before the payments begin that the environmental authorities and the paying agencies agree on precisely what (if anything) the farmers of Natura 2000 farmland will be required to do. Equally important is the need to make sure that the farmers understand this, to avoid any possibility of them damaging Natura 2000 habitats (for example by converting extensively managed arable land to EFAs) because they believed it was a condition of payment.

### **Payments for areas with natural constraints (Pillar 1 and Pillar 2)**

The current natural handicap or Less Favoured Area (LFA) payments in Pillar 2 are revised substantially by the draft legislation for the post-2014 CAP, in ways that could potentially

---

<sup>49</sup> COM(2011)625 final/3 Title III Article 20

<sup>50</sup> COM(2011)625 final/3, Title VI Articles 47-51 and 10, Annex IV

<sup>51</sup> In the draft legislation the opt-in period is set to end on 15 October 2014.

benefit Natura 2000 farmers, provided their farmland is not excluded by the changes Member State make to eligible areas and types of payment.

These so-called LFA (or natural handicap) payments have long provided crucial support for the maintenance of extensive livestock grazing systems, which are of fundamental importance for many key agricultural habitats and species. For example, in Italy most of the low productivity alpine grazing is publicly owned, and the local municipalities use LFA payments to support the traditional transhumance systems of extensive grazing. The measure also provides important socio-economic support for disadvantaged rural areas, and therefore a number of Member States target a large proportion of their RDP budgets to this measure (including Austria, Finland, France, Ireland, Italy, Luxembourg, Slovakia and Slovenia). More than half of Poland's farmland receives LFA payments, and overall, more than half of the farmland in the EU has been classified by Member States as LFA. The use of this measure is considered to send an important message about the social value of farming in these areas and highlight a societal commitment to their economic viability (Poláková et al, 2011). These payments are mostly without specific management requirements, and farmers have come to regard the LFA Pillar 2 payment as a form of CAP income support, although some Member States have chosen to replace the LFA measure with more targeted agri-environment schemes (for example, in England and Wales).

Under the proposed Regulation, Areas with Natural Constraints (ANC) will be defined using new, biophysical criteria (which will result in some changes to current boundaries) and Member States will have the option of offering farmers in these areas two separate ANC payments: an additional Pillar 1 income support payment on top of the BPS and greening payments, and an up-dated version of the more familiar compensation payment under Pillar 2 (which was originally linked to numbers of livestock or area of crops, but is now paid on a per hectare basis).

Member States will be able to designate three different types of ANC area<sup>52</sup>:

- a) *Mountain areas* where the existence of very difficult climatic conditions substantially shortens the growing season because of altitude, or by existence of slopes that are too steep for non-specialised machinery over most of the area, or because of being north of the 62<sup>nd</sup> parallel;
- b) *Other areas as facing significant natural constraints* can be defined if at least 66% of the UAA meets the thresholds of one or more of a list of climate, soil and terrain criteria constraining production but Member States must exclude land within these areas where agricultural investment or economic activity has overcome the constraints;
- c) *other areas affected by specific constraints* where land management should be continued in order to conserve or improve the environment, maintain the countryside, preserve the tourist potential, or protect the coastline.

---

<sup>52</sup> COM(2011) 627 final/3 Article 33 and Annex II.

Care will be required to ensure that the significant new requirement to exclude agriculturally improved land from type b) is not used in a way that excludes certain Natura 2000 farmland (for example hay meadows).

There is no obligation for Member States to set up ANC payments under either Pillar but if they do so, Natura 2000 farmers with land in the new ANC areas will be able to claim the ANC compensation payments and also Pillar I income support (unless they opted for the simplified SFS, which precludes all other Pillar 1 payments). There is no indication in the legislation of the level of ANC income support payments, which can be regionally differentiated, but the total budget for these payments will be no more than 5 per cent of the national budget ceiling for Pillar 1<sup>53</sup>.

The Pillar 2 ANC payments will be within the range €25 to €300 per ha per year, based the income foregone and costs incurred as a result of the natural handicap, compared to farmland with no handicap. This comparison requirement is a significant change to the payment calculation which may lead to increased payment rates on some HNV and Natura 2000 land, compared to the current period, but this will depend very much on how the comparison is made and what costs are taken into account. In situations where there is a risk of abandonment of Natura 2000 farmland it is important to take the full cost of farming the land into account (Barnes et al, 2011). These ANC payments would be degressive for farms above a certain size<sup>54</sup>.

### ***Payments coupled to Natura 2000 farming systems (Pillar 1)***

The legislative proposals for the next period of the CAP include an instrument (similar to the current Article 68) that would enable Member States to use up to 10 per cent of their national budget ceiling make annual payments coupled to specific production systems undergoing difficulties, where these are particularly important for economic, social or environmental reasons<sup>55</sup>.

These types of payment can be a useful targeted support for economically vulnerable types of livestock farming, particularly in upland and mountain areas, although Member States have generally not set any environmental criteria for farmers receiving Article 68 funds, or measured whether environmental benefits were achieved (IEEP & Alterra, 2010). Member States have mainly used the option to support the beef sector, with some support for sheep, goat and dairy, particularly in economically or environmentally sensitive areas (Pitts et al, 2010). Examples of the use of Article 68 payments for nature conservation are schemes for extensive livestock in the Burren Natura 2000 area in Ireland (see case study in annex E); for local breeds and extensive livestock in Portugal, notably on HNV meadows and *dehesas*; and for extensive livestock and permanent pasture in Denmark (Hart et al, 2010).

### ***Payments for organic farming (Pillar 2)***

Many extensive Natura 2000 farming systems would require relatively few changes to meet the standards of organic production. CAP support for organic farming systems could be an important additional source of income support payments for Natura 2000 farmland in those

<sup>53</sup> COM(2011)625 final/3 Articles 34 and 35

<sup>54</sup> COM(2011)627 final/3 Article 32

<sup>55</sup> COM(2011)625 final/3 Articles 38 - 41

Member States that have large proportions of their permanent pasture under organic systems<sup>56</sup>, and also potentially for extensive sheep and goat grazing systems in Mediterranean countries such as Greece, Italy and Portugal, and for extensive arable systems on marginal land, (eg. see case study of cereal production in Spain).

In the CAP reform proposals<sup>57</sup> support for conversion to and maintenance of organic farming systems is separate from the agri-environment-climate measure, but is similar in structure, with five to seven year annual payments. The payment calculations include provision for transaction costs, at the enhanced rate of 30 per cent where groups of farmers apply for the organic payment.

### 5.6 CAP support for building the capacity of the Natura 2000 farms

Without support many Natura 2000 farms will simply not survive, and the long-term economic and environmental viability of Natura 2000 farming systems depends on building the administrative and environmental capacity of the farmer and the economic capacity of the farm:

- to take advantage of the opportunities offered by publicly funded support the farmer must first understand the Natura 2000 objectives and the vital role that his/her farming plays in achieving these; and secondly the farmer must have the knowledge and administrative capacity to apply for these payments and services, to understand what is required and to maintain the necessary records. It is particularly important that farmers understand that the objectives of support are environmental, not agricultural intensification.
- many Natura 2000 farmers would be able to reduce costs and improve income if they were able to use labour saving technology, access markets for Natura 2000 farm produce and meet quality standards. Building the capacity of the farm business and farm workers in this way can secure farm and family income without compromising environmental services.

Public support for capacity building comes from both Pillars of the CAP, but it is essential that this support is tailored to the specific needs of Natura 2000 farmers and farming systems in meeting the environmental objectives. The range of capacity building support includes:

- farm advisory services (Pillars 1 and 2)
- knowledge transfer and information (Pillar 2)
- Investment in physical assets (Pillar 2)
- farm and business development (Pillar 2)
- Income support and other payments for young farmers (Pillar1 and Pillar 2)

---

<sup>56</sup> These include the Czech Republic (over 25%), Greece, Latvia and Slovakia (all over 15-16%), and Austria and Portugal (over 10%) (EC, 2010)

<sup>57</sup> COM(2011) 627/3 Article 30

### **Farm advisory services (Pillar 1 and Pillar 2)**

The provision of advice, support and training for farmers is crucial for the survival of Natura 2000 farming systems and the successful management of key habitats and species.

There is still a substantial unmet need for advice and support amongst farmers in the EU - in 2008 only around 5% of farmers receiving direct payments were given one-to-one advice (European Commission, 2010b). Small farmers are not being properly reached by advisory services and cross-compliance advisers often lack training in habitat and species conservation on farmland. There is also a need for effective links between research and cross-compliance implementation (Angileri, 2011). Some farmers have said that the fear of contravening cross-compliance requirements stop them from implementing conservation measures (Goßler, 2009). This illustrates the importance of communication and dissemination of information on biodiversity issues to farmers in the context of their farm management as a whole, and assessing and advising on the specific situation of the farmer, not just presenting general information

Member States are obliged under current CAP legislation to set up a Farm Advisory System (FAS), which must provide accessible advice on cross compliance to all farmers receiving direct payments (although it can cover other issues and provide support for the implementation of rural development measures, such as agri-environment). Large farms have been the main beneficiaries of the FAS to date have been and authorities in some Member States have had problems in reaching small farms.

Under the proposed CAP legislation<sup>58</sup> Member States will be obliged to extend the scope of the FAS beyond cross-compliance and 'green' payment requirements to provide farmers with advice '*where appropriate*' on a lengthy list of topics<sup>59</sup> in four groups: climate change, biodiversity, water, notification of diseases and innovation. For biodiversity the list includes the Habitats and Birds Directives, and support measures for agri-environment, non-productive investments and organic farming. Member States can, if they wish, give certain categories of farmers priority access to the FAS for, but they must at least give priority to the farmers who have the most limited access to other advisory services, and must ensure that farmers '*have access to advice reflecting the specific situation of their holding*'<sup>60</sup>. The FAS must also cover '*the sustainable development of the economical activity of small farms*', in particular the beneficiaries of the Small Farmers Scheme<sup>61</sup>.

The proposed scope and requirements for the FAS from 2014 offers Member States an opportunity to provide very specific advisory services tailored to the environmental and economic needs of Natura 2000 farmers. However, there is no guarantee that they will do so, or that the advisory needs of Natura 2000 and HNV farmers will be prioritised over the needs of the much larger group of more intensive farmers, despite the strong steer in the

---

<sup>58</sup> COM(2011) 628/3 Articles 12 - 15

<sup>59</sup> COM(2011) 628/3 Annex I

<sup>60</sup> COM(2011) 628/3 Article 14

<sup>61</sup> COM(2011) 628/3 Article 12 (2)d

draft legislation that Member States should make an effort to provide recipients of agri-environment-climate payments ‘with the required skills and knowledge’<sup>62</sup>.

**Box 5.2. Examples of Farm Advisory Services for farmers who manage Natura 2000 habitats and species**

**Austria** and the **German** Federal State of **Rheinland-Pfalz** are pioneering integrated conservation and agronomic farm advice services, which are delivering better on-farm conservation of species and habitats, especially farm-specific adaptations of agri-environment schemes and innovative voluntary initiatives.

In the Târnava Mare area of **Romania**, the NGO Fundația ADEPT Transilvania has set up a Farm Advisory Service linking biodiversity conservation, Natura 2000 habitat and species conservation obligations, and rural income support, in cooperation with local communities and the Romanian Ministries of Agriculture and Rural Development (MARD) and Environment and Forests (MEF). Its vision is to achieve biodiversity conservation at a landscape scale by working with small-scale farmers to create incentives to conserve the semi-natural landscapes they have created. The service has helped the small-scale farmers gain eligibility for CAP direct payments, helped design and promote targeted agri-environment schemes, and opened up marketing opportunities for farmers.

In **Scotland (UK)** the Strathspey Wetlands and Waders Initiative was launched to address the problem of a sharply declining local populations of waders such as curlew (*Numenius arquata*) and redshank (*Tringa tetanus*) in the semi-natural floodplain of the River Spey, where numbers of breeding birds had fallen by 42 per cent between 2000 and 2010. The aim was to foster collaboration between conservationists, agriculturalists and land managers to produce high quality habitat management plans at a landscape scale, and to encourage uptake of agri-environment payments. Landowners and tenant farmers are offered very specific on-the-ground advice about breeding bird habitats, for example required grass height for feeding, the proportion of the pasture where rush (*Juncus*) is allowed to grow and the number of shallow pools needed. There are also other forms of capacity building such as training, research, and networking. Technical advice is provided by a combination of actors including the Scottish Agricultural College, Cairngorm National Park Authority, independent agricultural agents and the Royal Society for the Protection of Birds (RSPB), an environmental NGO. Results collated in February 2012 showed 2,250 hectares of land registered within the Initiative and it is hoped that in time this positive uptake and improved management of the wetlands will reverse the decline in the wader population.

Provision of the FAS is a requirement of Pillar 1, but the funding for Member States to set up the FAS and other advisory services comes from a co-financed RDP measure<sup>63</sup> in Pillar 2. The payments under this measure are made to the providers of advisory services, and there is also financial support for adviser training. Effectiveness of the FAS will depend on the quality and expertise of those providing advice and how they engage and communicate with land managers. Advisors also play a crucial role as a link between researchers and farmers by identifying needs coming from the farmers, assembling practical experiences, and applying knowledge from research to local situations. Care is required to ensure that those providing the advice have the necessary technical capacity and expertise to do so, especially for

<sup>62</sup> COM(2011) 627 final/3 Recital 28, page 17

<sup>63</sup> COM(2011) 627 final/3 Article 16

Natura 2000 farmland, so this could be an important source of funding for both training advisers and providing a service for farmers. Member States often provide advice on agri-environment schemes to farmers through a separate organisation or private contractors<sup>64</sup>, but these services can also be provided by locally-based organisations such as NGOs and farmers' associations and often play a critical role in bridging the gap between small farmers and advisory services, as illustrated by the examples in Box 5.2.

### ***Knowledge transfer and information (Pillar 2)***

In addition to the provision of advice, Member States can use this RDP measure to fund the provision of vocational training and skills training, workshops and coaching, demonstration activities and farm visits and short-term farm management exchanges. Funding can also be provided to train the staff providing the service and to cover the costs to the farmers of attending these events (travel, accommodation, per diem expenses and the cost of replacing the farmer during his/her absence). Training and information exchange can be tailored to support any combination of measures at any degree of detail, with the overall objective of improving land managers' ability to deliver the objectives of Natura 2000.

Workshop activities and demonstrations could help to engage land managers in delivering benefits that are difficult to achieve at a farm scale and require landscape scale intervention; for example habitat networks or managing an extensive area of key habitat. On-farm visits and farmer-farmer exchanges have a particularly important role in encouraging farmers to join agri-environment schemes, to raise their motivation and encourage creativity and innovation in management practices for conservation (see eg. case studies from Ireland, Germany, Czech Republic, Romania Austria and Netherlands, among other, where efficient advisory systems and regular communication with farmers have been set up).

This measure has greatest potential where used in conjunction with land management measures where knowledge transfer and information is tailored towards the needs of a specific scheme or project. This potentially could include nature conservation organisations, other NGOs, and existing farmers who already deliver advice on a voluntary basis and provision does not have to be restricted to managing authorities or public bodies.

### ***Investment in physical assets (Pillar 2)***

This measure in the draft legislation will support investments that range from improving overall performance of the farm to processing, marketing and development of products, and infrastructure improvements<sup>65</sup>. It also supports non-productive environmental investments (discussed separately in section 5.8 below). Levels of support can be increased (up to a maximum of 90 per cent of the cost) for young farmers, group investments, integrated projects and in some ANC areas.

Many of these investments could improve the economic viability of extensively managed Natura 2000 farming systems. For example, small dairy units might be retained through the funding of on-site or nearby dairy processing units that generate income from added-value products for local producers. Investments in improving manure storage and water efficiency

<sup>64</sup> Under measure 111 in the current EAFRD

<sup>65</sup> COM(2011) 627 final/3 Article 18(1)(d)

on farm holdings have the potential to reduce costs and bring indirect benefits for biodiversity and habitats by improving water quality or availability and reducing nitrogen pollution, as well as greenhouse gas emissions (Boccaccio et al, 2009; EC, 2010). Under the current RDPs Cyprus is supporting investment in ‘land development for livestock farming’, including planning, landscaping and infrastructure (water, electricity) for grazing areas. In France, Italy, Spain and the Czech Republic investment support is explicitly linked with mountain areas and mountain farming activities. However, EAFRD resources have also spent been on investments under this measures that can pose environmental risks (Boccaccio et al, 2009) and particular care should be taken to ensure that support provided under this measure for Natura 2000 farms avoids direct or indirect negative environmental impacts.

In the new Member States these measures have the potential to provide important support to maintain Natura 2000 farming systems, especially when used in combination with tailored diversification and business development measures, for example by improving access to markets. However small and semi-subsistence farmers may not be a priority for investment support and the use of this measure requires overcoming significant challenges, including: the difficulty of individually targeting smaller producers who are not registered; the costs associated with reaching large numbers of very small holdings, farmers’ reluctance to co-operate, and the high age and low level of education of many subsistence farmers (Redman, 2010).

### ***Farm and business development (Pillar 2)***

Farm and business development can be an essential tool for supporting small holdings and semi-subsistence farms, and this proposed measure<sup>66</sup> provides business start-up aid for young farmers, small farms and for diversifying into non-agricultural activities.

This measure can also be used to offer recipients of the small farmer payment (described in section 5.5) an annual payment until 2020 if they transfer their entire holding and corresponding entitlements to income support payments to another farmer.

Although there is no specific mention of environmental priorities in the draft legislation this support could, if carefully targeted as part of a package of measures, help maintain the economic viability of Natura 2000 farms and communities in vulnerable areas.

### ***Income support and other payments for young farmers (Pillar1 and Pillar 2)***

One of the problems for the long-term management of Natura 2000 and other HNV farmland is that many farmers are approaching retirement age and have no successors. An important part of capacity building for many farms is securing future jobs for young people, both as farmers and in associated processing sector, and young farmers will potentially benefit from several proposals on the draft legislation.

Member States will be required to provide young farmers with an annual top-up payment of their BPS for up to five years, as part of the proposed reform of Pillar 1<sup>67</sup>. The value payment will be around 25 per cent of their BPS and available to young farmers under the age of 40 who are setting up their own farm for the first time (or have done so within the five years

---

<sup>66</sup> COM(2011) 627 final/3 Article 20

<sup>67</sup> COM(2011) 625 final/3 Articles 36 and 37

before they first apply for the BPS). Member States will have the option of targeting some RDP measures at young farmers, including investment support and specific business start-up aid, and young farmers could find it easier to acquire additional land if Member States choose to offer small farmers a payment as an incentive to transfer their land and entitlements, as described above.

### **5.7 CAP and other support for adding value to the produce of Natura 2000 farms**

Many farmers on Natura 2000 and HNV grasslands face challenges selling their products, because they are often small producers in remote areas where there are few customers who can pay premium prices. On the other hand, some are well-placed to take advantage of direct marketing to eco-tourists and tourist services such as hotels and restaurants. In some regions Natura 2000 farmers have built up successful direct marketing connections to supermarkets.

The range of support for farmers seeking to add value to their produce includes::

- Setting up producer groups (Pillar 2)
- Quality schemes for agricultural products (Pillar 2)
- Labeling and Protected Designation of Origin

#### ***Setting up producer groups (Pillar 2)***

Support under this measure for setting up producer groups for farm (or forest) products could help Natura 2000 farmers achieve the benefits of economy of scale in marketing environmentally sustainable produce. Specifically aimed at SMEs, this measure<sup>68</sup> provides funding over five years for setting up producer groups for the purpose of adapting production to market requirements, joint marketing, establishing rules on product information, developing business skills and innovation.

#### ***Quality schemes for agricultural products (Pillar 2)***

The establishment of local and regional markets for good quality natural-based products from Natura 2000 sites can improve farm income and help to maintain traditional extensive farming systems. For example, these systems can offer added value products such as 'green' beef, cheeses, wines, fruit and honey, products from endangered local breeds of livestock or crop varieties and from wild fruits, mushrooms and medicinal plants. Quality local products also stimulate tourism and thereby further boost income for local communities. This proposed measure<sup>69</sup> provides reimbursement for the costs to farmers of participating in quality product certification schemes, including those that guarantee specific farming or production methods. Support is for a maximum of five years.

#### ***Labelling and Protected Designation of Origin***

Labelling is being successfully used in combination with direct marketing to support extensive farming management of Natura 2000 sites using traditional livestock breeds, as illustrated by the examples in Box 5.3. In order to maintain the benefits for extensive

---

<sup>68</sup> COM(2011) 627 final/3 Article 28

<sup>69</sup> COM(2011) 627 final/3 Article 17

farming and production practices as well as the cultural value of the regional identity, the target markets often need to be organised locally or regionally, and trust and a direct relationship between producers and consumers are critical to the success of labelling schemes. Many local labelling schemes also exist, including ones that specifically refer to Natura 2000 areas.

Organic certification can also improve the profitability agricultural products from extensive livestock systems, and organic labels include the EU leaf label and various national or independent IFOAM-associated accreditation schemes and labels<sup>70</sup>. It is currently not possible to quantify the amount of organic production from Natura 2000 areas, but organic farming plays a significant role in supporting extensive sheep and goat grazing in Mediterranean countries, including the production of regional cheeses such as Feta, Caprino, Casu Marzu, or Halloumi. (Pillar 2 support for organic farming is described in section 5.5 above).

An EU-wide labelling scheme for Protected Designation of Origin (PDO) protects agricultural product names from defined areas (and there are other, less demanding schemes for Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG) labels<sup>71</sup>). To qualify for the PDO label the product must have qualities and characteristics that are essentially due to its region of production, and it must be produced, processed and prepared exclusively within that region. Examples of PDOs are *Prosciutto Toscano* (ham from Italy's Tuscan region) and *Bryndza Podhalańska* (Polish sheep's milk cheese).

Some examples of successful uses of the PDO label to market products from Natura 2000 habitats are shown in Box 5.4. It is important to note however that the PDO label provides no guarantee that the product has benefited biodiversity anywhere, much less Natura 2000 sites, because the label criteria do not generally specify habitat management measures. Local 'Natura 2000' labelling schemes may benefit Natura 2000 farmland management more directly.

---

<sup>70</sup> International Federation of Organic Agriculture Movements <http://www.ifoam.org/>; <http://www.organic-bio.com/en/labels/>

<sup>71</sup> *[The requirements for the Protected Geographical Indication (PGI) label only require a good reputation of a product from a given region (rather than objectively different characteristics) so long as any of the steps of production, processing and preparation take place within the region. Examples of PGIs are Scotch Beef and Lamb from Scotland, Stilton Cheese from three counties in England, Oscypek (smoked cheese made from salted sheep's milk) from the Tatra mountains in Poland (or wherever Tatra natives have emigrated). The Traditional Speciality Guaranteed (TSG) label can be used for products which are manufactured using traditional ingredients or that have properties characteristic of a traditional type of manufacturing or processing, but the product does not have to be manufactured in a particular area. This system works in parallel with systems used in particular Member States, such as the Appellation d'origine contrôlée (AOC) used in France, the Denominazione di origine controllata (DOC) used in Italy, the Denominação de Origem Controlada (DOC) used in Portugal, and the Denominación de Origen (DO) system used in Spain. For some products, the national label is shown instead of the EU label, for example for wine and cheese in France ]*

### Box 5.3. Examples of successful local labelling schemes supporting Natura 2000 farmland management

(See also the Luxembourg, Estonian and Spanish case studies in Annex E)

**Estonia – coastal meadow meat.** Projects to restore the management of boreal coastal meadows have stimulated a growing market for local high quality organic meat. The newly established cattle breeders' society is organising study-tours for themselves and farmers from neighbouring areas. A revival of traditional handicrafts using local raw materials has established a tradition of local-product fairs in the island of Hiiumaa, and local tourism businesses are growing.



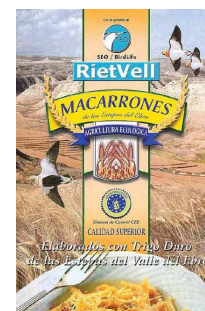
**Germany – Rhönschaf.** the Rhön Biosphere Reserve used LIFE funds to promote sheep meat from the Natura 2000 grasslands as a nature-friendly product through the co-operative "Natur- und Lebensraum Rhön e.V.". A typical shepherd on one of the restored sites was, by 2002, selling 70% of his annual lamb surplus directly to local restaurants and hotels at good prices. Local hotels and restaurants in the network committed themselves to only use Rhön sheep products on their menus, and to promote to visitors how consumption of these dishes helps to preserve the landscape they have come to enjoy.



**Germany – Altmuehtaler Lamm.** The Altmuehtal region in Bayern is characterised by juniper scrub on calcareous grasslands (Annex I habitat type 5130). Shepherded sheep flocks produce high-quality lamb meat and wool. Shepherds and landowners in the regional co-operative agree to graze at least half their sheep within the nature reserve Altmuehtal, feed only locally produced supplementary feed, and follow guidelines for animal welfare, grazing density, and a ban on pesticide and fertiliser use. The shepherds are guaranteed a fair price, and the lamb meat is sold in local hotels and butchers.



**Spain - Riet Vell.** SEO/BirdLife created a company devoted to the production and marketing of organic products linked to nature conservation (Riet Vell). The company has been successful in marketing rice produced in the Ebro delta (SPA) and organic durum wheat from Belchite and Monegros steppes (mostly produced in Natura 2000 areas) and producing macaroni and spaghetti of high quality from the latter. Since 2003, Riet Vell has sold around 180,000 kg of produced (see case study from Spain for further details).



Sources: <http://www.altmuehtaler-lamm.de/>  
<http://ec.europa.eu/ourcoast/index.cfm?menuID=7&articleID=29>,  
<http://www.unesco.de/fileadmin/medien/Dokumente/unesco-heute/uh2-07-p44-45.pdf>

**Box 5.4 Examples of products registered under the EU Protected Designation of Origin label (PDO) that are benefiting Natura 2000 habitats**

**Germany:** The PDO scheme for moor sheep meat ('Diepholzer Moorschnucke') helped to establish profitable management of **semi-natural moorland and Ramsar-listed wetland habitats** in Diepholz, Germany, which would otherwise have deteriorated. The scheme uses a local breed of sheep that was traditionally used for grazing moorland and wetlands. The management has contributed to the regeneration of more than 5,000 ha of moorland. A number of endangered species, including sundew and wood lark, have recovered in the area, whilst the preservation of the traditional sheep breed enhances agro-biodiversity.

**France:** PDO Pays d'auge cider and Calvados from traditional apple orchards, which are important habitats for hole-nesting birds and bats.

**Spain:** A successful PDO scheme for ewe's milk cheese ('Idiazabal') from the extensively grazed **mountain habitats** in the Basque and Navarra regions, Spain, involves production methods based on low-intensity grazing with traditional sheep breeds *Laxta* and *Carranzana*. The market for the product helps maintain the transhumance and shepherding which has shaped the semi-natural habitats.

**Spain:** The traditional rice varieties produced through the PDO scheme 'Arroz de Valencia' are cultivated within the protected **wetlands** of the Albufera National Park in the region of Valencia, important for migratory and water birds, as well as amphibians, fish and many other species. The production methods are tailored to the habitat, relying on varying flooding levels which sustain wetland soil conditions, and minimise use of agro-chemical inputs.

**Spain:** In traditionally managed **dehesas**, pigs forage for acorns in autumn-winter and graze during spring, often together with sheep or cattle grazing. The PDO Iberian ham produced from pigs grazed on dehesas can be labelled "acorn fed" (*de bellota*) if the pigs feed on acorns only for at least 60 days before slaughter, and includes the condition that inspectors check that stocking density is within the carrying capacity of the dehesa (in terms of acorn production). The pigs must therefore graze in the dehesa for at least part of the year to meet the PDO requirement, thereby supporting the sustainable use of this habitat.

Sources: (Ecologic, 2006a; Oppermann and Spaar, 2003; Verhulst et al, 2007)

## 5.8 CAP support for the management of Natura 2000 farmland habitats and species

The earlier sections of this chapter have described potential sources of CAP support to ensure the survival of extensive Natura 2000 farming systems and to build the capacity of these farms. This section describes the habitat and species management payments that build upon this foundation to secure the conservation of Natura 2000 areas, starting with sources of finance to help with the preparation of Natura 2000 management plans, because these plans (or similar initiatives) underpin the design of key support measures, including agri-environment-climate payments and non-productive investments. This range of support includes:

- Preparing and updating Natura 2000 management plans (Pillar 2)
- Agri-environment-climate payments (Pillar 2)
- Non-productive investments linked to agri-environment and Natura 2000 (Pillar 2)
- Natura 2000 compensation payments (Pillar 2)
- Animal welfare payments (Pillar 2)

- Prevention of damage to forests from forest fires and restoring agricultural production potential (Pillar 2)

### **Preparing and updating Natura 2000 management plans**

This proposed measure<sup>72</sup> is specifically designed to finance the drawing-up and updating of *'protection and management plans relating to Natura 2000 sites and other areas of high natural value'*. Funds are also available for small scale infrastructure and for studies and investments associated with *'the maintenance, restoration and upgrading of the cultural and natural heritage of villages and rural landscapes'*<sup>73</sup>. Most EU subsidies cannot provide the type of funding offered here for enhancing or supporting participatory processes to develop management plans, and this measure could be used to a much greater extent to support the development of robust management plans for Natura 2000 sites, using participatory approaches to ensure that stakeholders support the management objectives (Boccaccio et al, 2009) and helping to avoid the risk of conflicts that have occurred in a number of Member States (Apostolopoulou and Pantis, 2009; Grodzinska-Jurczak and Cent, 2011; Keulartz, 2009; Rauschmayer et al, 2009).

A number of other Member States are using the equivalent measure in the current RDPs. For example, in France this measure is used to finance Natura 2000 management plans, Natura 2000 contracts with non-farmer or non-forester owners, and awareness raising actions; measures to reduce conflicts with large carnivores are implemented in France using this measure. Finland environmental NGOs now have the possibility of getting funding under this measure for making management plans for privately owned Natura 2000 forests, and for example promoting them as ecotourism sites (Figeczky et al, 2010). The measure has been broadly used in Germany to develop Natura 2000 planning, maintenance/restoration of habitats and implementation of species conservation programmes, Water Framework Directive projects and nature conservation consultation services. In Wales this measure is being used to support the restoration of floodplain grazing marsh and saltmarsh at the *Ynys-hir* nature reserve, and to improve visitor access and facilities to the site, public understanding of the site and its objectives and encourage effective partnership working across the tourism sector (Allen et al. 2012b).

### **Agri-environment-climate payments**

This remains the only measure that Member States are obliged to implement in their RDPs, but in the proposed legislation the scope of the measure has been widened, as the new name indicates<sup>74</sup>. The purpose of these payments is to *'further encourage farmers and other land managers to serve society as a whole by introducing or continuing to apply agricultural practices contributing to climate change mitigation and adaptation and compatible with the protection and improvement of the environment, the landscape and its features, natural resources, the soil and genetic diversity. In this context the conservation of genetic resources in agriculture and the additional needs of farming systems that are of high nature value should be given specific attention'*<sup>75</sup>.

<sup>72</sup> COM(2011) 627 final/3 Article 21 (1)(a)

<sup>73</sup> COM(2011) 627 final/3 Article 21 (1)(f)

<sup>74</sup> COM(2011) 627 final/3 Article 29

<sup>75</sup> COM(2011) 627 final/3 Recital 28, page 17

The addition of climate to the agri-environment measure is a significant change, signalling a commitment to support for agricultural and forestry management practices contributing towards climate change adaptation and mitigation, which may become even more significant if the EU adopts rules for accounting for greenhouse gas emissions from land use, land use change and forestry. Other changes include a new emphasis on group applications from farmers and other land managers, accompanied by more generous transaction costs, which could help secure larger scale habitat and species management for Natura 2000 if Member States choose to use these. The effective use of cooperative approaches and group applications to agri-environment schemes can already be seen in the Netherlands (Franks and McGloin 2006).

The measure offers farmers and other land managers annual payments in return for providing, through multiannual commitments, an environmental management service by following clearly defined management practices. These practices produce a specific environmental benefit above and beyond the reference level of protection already provided by environmental regulation and cross-compliance (see section 5.4 for details of the reference level). Participation is voluntary, and to receive the payment, farmers must sign a management contract with a managing body, usually for five to seven years. The contract specifies the farm level management requirements, often in considerable detail, and may require planning and record keeping (for example of nutrient use and stock movements)<sup>76</sup>.

Agri-environment measures may be designed, targeted and delivered at the national, regional or local level. This is one of the most flexible CAP support measures and allows Member States the freedom to address environmental priorities in a way that reflects the great variety of local bio-physical, climatic, environmental and agronomic conditions on different farms and in different European regions. Member States have developed a wide range of different agri-environment schemes, not just in response to different environmental priorities and pressures, but also in response to societal preferences, institutional arrangements and financial and political pressures (Farmer, 2011).

A number of Member States have agri-environment schemes specifically tailored to the management of Natura 2000 sites or HNV farmland with Natura 2000 habitats and species (see Boxes 5.5 and 5.6). For example, Spain supports its traditional extensive arable-sheep farming system through an agri-environment scheme (Caballero and Fernández-Santos, 2009). However, some States (such as Greece, France and most of Spain) currently spend little of their EAFRD budget on agri-environment (Boccaccio et al, 2009). The schemes need to be balanced to respond to both the needs of biodiversity in the whole farming landscape, and the rarer habitats and species of Community Interest.

Land managers who are not primarily farmers, such as private nature conservation bodies, own significant areas of land important for biodiversity. Agri-environment climate support can be paid not just to farmers but also other land managers where *'duly justified to achieve environmental objectives'*. In the design of RDPs care should be taken to ensure that support

---

<sup>76</sup> Recipients of agri-environment payments must also comply with requirements on the use of fertilisers and plant protection products which Member States must define (as required by Article 39(3) of Regulation 1698/2005)

is available to those individuals best placed to carry out the environmental management necessary to deliver environmental priorities.

Heritage and local breeds of livestock, especially cattle and sheep, are important for management of semi-natural pastures, and the support this measure provides for their conservation and utilisation is a useful resource for Natura 2000 farmland management. Agri-environment schemes for the conservation of genetic resources are currently used, for example, in Italy, Portugal, Germany, and Austria to support a significant proportion of national breeds of cattle with measures (Nitsch, 2006). Hungary has schemes for Hungarian grey and flecked cattle, Mangalica pigs and Racka sheep which graze Pannonic salt steppes and marshes; Estonia has schemes for the Estonian native horse and the Estonian cattle breed on coastal meadows; and Slovenia supports 14 animal breeds, including Cika cattle, the Carniolan honey bee, and Jezersko-Solčava sheep grazing alpine meadows. In Bulgaria, the funding of Karakachan sheep guarding dogs is an important support for extensive grazing of Annex I habitats.

The success of agri-environment-climate schemes depends on several factors. The provision of support for farmers including advice and training is very important, and sufficient technical institutional capacity to design schemes and monitor outcomes. Schemes are more successful if they are designed with participation of the farmers themselves, and use farmer's knowledge in the design (for example, see case studies from Germany, Czech Republic, Romania and Estonia).

Agri-environment-climate contracts are optional for the farmer, and successful uptake depends on payments rates that reflect the true cost to the farmer and provide sufficient incentive for the maintenance of economically unviable farming systems. Agri-environment payments are calculated as the additional costs and income foregone as a result of the management requirements, but the way this formula is used does not address the case of farms with very low farm incomes, particularly HNV upland livestock farms, that are already delivering a high level of environmental management, but which have no income to forego and where there may be no need to change the farming system and thus incur additional costs. Without agri-environment payment rates that also take account of the labour costs and fixed costs of the farming system, the economically realistic choice for these farmers is to abandon farming. Member States could make more use of the flexibility in the trade rules underlying this formula to reflect the full cost of continuing HNV farming where there is a proven risk of abandonment or intensification (Barnes et al, 2011; RSPB & Birdlife International, 2011). A key element of the payment calculation, often ignored by Member States is an additional payment for the farmer's transaction costs (the time and effort spent in setting up and administering the contract. This can add a further 20 per cent to the payment calculation (30 per cent for group contracts) and make a crucial difference from the farmers point of view but many managing authorities do not currently add transaction costs for agri-environment payment calculations, despite evidence that this can affect uptake (Keenleyside et al 2011). The proposed regulation emphasises the importance of using transaction costs in future, when farmers enter contracts jointly<sup>77</sup>.

---

<sup>77</sup> COM(2011) 627 final/3 Recital 28, page 17

**Box 5.5. Agri-environment schemes designed for Natura 2000 habitats**

Sources: (IEEP & Alterra, 2010; Poláková et al, 2011; RSPB & Birdlife International, 2011) and Natura 2000 farmland management case studies (see also annex E)

**Romania – HNV meadow management.** The scheme includes requirements for the use of traditional manure, no use of chemical fertilisers, collections of mass cuttings within 2 weeks after mowing, restrictions on grazing in flooded pastures; an additional payment is available for the ‘maintenance of traditional practices’ (involving a prescription to use manual mowing only) (ENRD, 2010; Gütthler & Oppermann, 2005; Riccheri, 2006). The scheme enables the maintenance of the traditional landscape pattern of mosaic management of hay meadows, with a variety of mowing dates, which is ideal for diverse animal and plant communities to thrive.

**Slovakia – management of semi-natural pastures and meadows.** Agri-environment schemes for the protection of semi-natural and natural grassland involve management tailored to seven types of grassland (dry grasslands, mesic grasslands, mountain hay meadows, wet grasslands of lower altitudes, alluvial *Cnidion* grasslands, wet grasslands of higher altitudes, fen and *Molinia* meadows, high-mountain grasslands) that are recognised within the National Grassland Inventory as semi-natural (based on diagnostic species). Management prescriptions include mowing between specified dates, shepherding without the use of fences, a prohibition on drainage and no mulching. Grazing is prohibited on fen and *Molinia* meadows. On lowland alluvial meadows and on mountain hay meadows grazing is allowed after the first cut. More than 102,000 ha of semi-natural grassland are now funded by agri-environment measures (17 million EUR per year).

**Spain – maintenance of ‘dehesas’.** The agri-environment schemes implemented in Extremadura, Castilla-La Mancha and Andalucía (and Castilla-y-Leon under ‘forest environment’) include management requirements for no or limited cereal/leguminous/ fodder cropping (common in more intensively managed parts of ‘dehesas’), stocking densities of between 0.1 and 1.0 LU/ha and other restrictions to avoid over-grazing, to ensure the maintenance of landscape features (eg stonewalls), to maintain or increase tree density (*Quercus*, *Olea*), requirements for their pruning and regeneration as well as shrub management and some voluntary commitments such as grazing exclusion areas or organic cropping. The measure can be combined with another agri-environment scheme for the protection of local breeds – pig, cattle, sheep and others -- which traditionally support the Dehesa habitats, and organic rearing of livestock. (Ecologic, 2006b; Rauschmayer et al, 2009; SEO and Birdlife International, 2011)

**Sweden – Natura 2000 pasture management.** Sweden offers measures for pastures with specific values, such as limestone pasture, mountain pasture, hay meadows, and wetlands, applicable to several types of Natura2000 habitats. Other schemes have been designed for wooded pastures. The schemes encourage the continuation of low-input management appropriate for these habitats, with requirements involving grazing and harvest management, ban on use of pesticides, and limits on rotational ploughing.

**UK – common grazing of wet heathland.** Bringing common land into an agri-environment scheme is often difficult but in Wales (UK) the 16 commoners grazing sheep on 800 ha of a heathland Natura 2000 site have a 5 year agri-environment contract to increase cattle grazing levels during the spring and summer, with the aim of suppressing bracken and grazing the coarse vegetation which has begun to dominate the wet heath. Sheep numbers are limited in winter, to prevent over-grazing, and the non-productive investment measure has been used to clear bracken and scrub for habitat restoration.

### **Box 5.6. Successes in tailoring agri-environment measures to Natura 2000 species**

Sources: (Poláková et al, 2011; RSPB and Birdlife International, 2011), Liga para a protecção da natureza (LPN) personal communication; Natura 2000 farmland management case studies (see also annex E),

**France – fodder crops for Little Bustard (*Tetrax tetrax*).** Since a targeted agri-environment scheme was introduced to the Poitou Charentes region in 2004, the area has seen numbers of little bustard begin to bounce back. The scheme aims to tackle the two major causes of the bird's decline: nest destruction and starvation. Options include conversion from annual crops to fodder crops and grassland; restrictions on cutting alfalfa fields; and ban on insecticides and herbicides.

**Portugal – extensive cereal pseudo-steppe for the Great Bustard (*Otis tarda*) and other steppe birds.** The Castro Verde Zonal Programme agri-environment scheme supports farmers for maintaining traditional rotational cereal farming practices, and promotes the reduced use of insecticides and herbicides and low grazing levels. As a result the population of the Great Bustard (*Otis tarda*) in the area has doubled. Populations of the lesser kestrel (*Falco naumanni*) and Little Bustard (*Tetrax tetrax*) have also improved. This is despite the fact that the payment rates are insufficient to compensate farmers for the constraints on management activities.

**Slovenia - conservation of meadow orchards and associated birds.** The scheme supports the pruning and replanting of trees (min 50, max 200 trees/ha); restrictions on pruning dates for the established trees; grazing of species-rich pasture under the trees with restricted stocking densities; and limits to plant protection products and fertiliser application. Annex I species that benefit from traditional orchards include Little Owl *Athene noctua*, Hoopoe *Upupa epops* and Wryneck *Jynx torquilla*.

**United Kingdom (England) – grassland management for the Marsh Fritillary butterfly (*Euphydryas aurinia*).** Populations of the Marsh Fritillary butterfly, that had become almost extinct in large parts of Europe due to the loss of damp and chalk grasslands, have stabilised or are increasing as a result of implementing a targeted agri-environment scheme. The scheme funds management options that create an uneven patchwork of short and long vegetation on damp chalk grassland, using extensive grazing by cattle or traditional horse breeds, and selective mowing and scrub removal.

A few agri-environment schemes aimed at maintaining biodiversity-rich habitats or particular species are based upon 'payment by results', leaving flexibility for farmers to decide the type of management needed (see eg. case study from Ireland). This can work well for habitat types and species where an easily-monitored result is directly related to the overall status of the habitat, but can carry a higher risk for the farmers, because environmental results can depend on external factors beyond their control (for example weather and migration). It also presents difficulties for national authorities in checking compliance and may give rise to an elevated error rate and reduced payments. To succeed these schemes need to be well-designed and not offer too high a level of risk for the farmer.

### **Non-productive investments linked to agri-environment and Natura 2000**

This measure is an essential companion to the two environment-climate Natura 2000 measures, which provide annual payments for specified land management but do not offer investment support. Non-productive environmental investments, often required 'up-front'

at the start of a five -year contract, can be vital to the feasibility of implementing the land management requirements, especially in schemes targeted at HNV farming and Natura 2000 habitats and species.

Now presented as part of a broader investment measure<sup>78</sup>, the scope of the current EAFRD measure has been widened to include investments linked to the biodiversity conservation status of species and habitats as well as the more familiar non productive investments linked to the achievement of agri-environment commitments and enhancing the public amenity value of a Natura 2000 area or other high nature value area.

The measures can also be used to fund infrastructure that is needed for Natura 2000 habitat management, such as wetland dredging, restoration of water management systems to restore wetland hydrology, and access tracks, fencing and machinery. It can cover up to 100 per cent of the cost of environmental investments such as the restoration or establishment of hedges, fences, walls and other structures which have an environmental benefit but little or no productive purpose and so are unattractive economically for farmers. The measure is used widely alongside the agri-environment measure, and many agri-environment scheme actions are funded through both measures.

The measure provides important funding for habitat restoration work on Natura 2000 land, and investments can include, for example, scrub management and removal; restoration of traditional farmland structures, such as terraces, stone walls and sheep pens; restoration of wetlands, such as ponds, reedbeds, marshes, and ditches; and restoration of traditional orchards, olive groves, and wood pastures. Important to note for Natura 2000 management is that the installation of fencing, water supply, and other necessary livestock management infrastructures can make up a significant cost for environmental grazing regimes, especially where these are being reintroduced. Investment can also be supported to provide footpaths, bird watching hides and information for visitors to Natura 2000 sites, other protected nature conservation areas and HNV land.

### ***Natura 2000 compensation payments***

The proposed new EAFRD regulation contains some changes to the measure<sup>79</sup> to try to simplify it and encourage its use. Land managers who are not farmers will be eligible for payments if justified. Payments will also be possible on wildlife 'stepping stones' between Natura areas in order to contribute to the implementation of Article 10 of the Habitats Directive.

This measure is rather different from other EAFRD measures in that it provides compensation payments for restrictions on farmland and forest management imposed by the national legislation implementing the Habitats and Birds Directives (and also the Water Framework Directive). Payments to farmers, foresters or other land managers in Natura 2000 areas are dependent on formal designation of the Natura 2000 site, and the existence of a management plan or equivalent legislation that specifies the management actions that land managers are legally required to carry out to contribute to restoring and maintaining that site's favourable ecological status.

---

<sup>78</sup> COM(2011) 627 final/3 Article 18 (1)(d)

<sup>79</sup> COM(2011) 627 final/3 Article 31

Payments are standard flat rate per hectare, based on income foregone and/or costs incurred due to limits imposed by the Natura 2000 legislation that go beyond GAEC and SMR cross-compliance requirements. For example these might include limits on stocking density, grazing and mowing dates, or renunciation of drainage and afforestation activities.

This measure could be a very important part of a package of RDP measures aimed at improving the conservation status of key EU farmland habitats. It can be paid at standardised rates to eligible farmers and foresters, has relatively low transaction costs and provides a basis for more targeted agri-environment-climate and non-productive investment payments for example where habitat restoration or specialist management for Annex 1 species is required. The broadening of eligibility to include other nature conservation areas could help to improve habitat connectivity and biodiversity adaptation to climate change, but may be limited by the requirement for 'environmental restrictions' to be in place.

However, the use of the current Natura 2000 measure has been very limited in many Member States, accounting for only 0.5% of the current RDP spending in the EU as a whole. Only a few Member States allocated significant funding to this measure in their RDP budgets for 2007-2013, and by 2009 only Germany, the Czech Republic, Estonia, Lithuania and Latvia had reached their targets<sup>80</sup>. Ireland also allocated funds but had not reached its target. This is partly because many Natura 2000 sites do not yet have defined management requirements, which means that Member States have not been able to release any payments under this measure (European Commission, 2010c). For example, Poland's current RDP includes the option of direct Natura 2000 payments, but its implementation is postponed until the management plans are prepared and the real economic costs and limitations for the management can be calculated (CEEweb, 2011). Some Member States have expressed concern that the Natura measure would pay farmers to follow specifications for Natura 2000 sites that are already mandatory, as defined in their national legislation.

A number of Member States prefer to use the voluntary agri-environment measure to fund management on Natura 2000 sites, as these schemes have already been set up, are not dependent on a site management plan, and offer more flexible funding.

### ***Animal welfare payments (Pillar 2)***

The animal welfare measure in the CAP reform proposal<sup>81</sup> can be used to support farm operations that provide animal welfare that goes beyond mandatory commitments, including water and feed closer to their natural needs; improved housing conditions, such as space allowances, bedding, natural light; outdoor access, etc.

The existing measure is used by some Member States to support free grazing livestock systems, including Natura 2000 grazing. For example, Germany supports cattle on summer pasture including alpine meadows and cattle and pigs in loose housing stables (free stall

---

<sup>80</sup> European Network for Rural Development (2011) Rural Development Programmes 2007-2013 Output Indicators realised 2007-2009. Measure 213: Natura 2000 payments and payments linked to Directive 2000/60/EC (WFD) (updated June 2011). [http://enrd.ec.europa.eu/policy-in-action/rural-development-policy-in-figures/rdp-monitoring-indicator-tables/output-indicators/en/output-indicators\\_en.cfm](http://enrd.ec.europa.eu/policy-in-action/rural-development-policy-in-figures/rdp-monitoring-indicator-tables/output-indicators/en/output-indicators_en.cfm)

<sup>81</sup> COM(2011) 627 final/3 Article 34

barn) with grazing, the Emilia-Romagna region in Italy supports Parmigiano-Reggiano cheese producers grazing cattle in mountain areas, and Cataluña (Spain) provides additional support for organic livestock farmers (Zemekis et al, 2007). The animal welfare measure also supports the use of litter bedding, thus potentially providing a market for the cuttings of Natura 2000 litter meadows.

### ***Prevention of damage to forests from forest fires and restoring agricultural production potential (Pillar 2)***

Where Natura 2000 farmland is adjacent to forests (or the farmland that is registered as forest land) there are two measures which could be used to support or reinstate grazing on pastureland that has an important role as firebreaks between or with forests.

The measure for forests<sup>82</sup> provides support for land management operations that provides protective infrastructure, such as fire breaks, and the proposed new measure supporting the restoration of agricultural potential after natural disasters or catastrophic events (article 19<sup>83</sup>), could potentially be used to fund habitat restoration actions after fire, such as the reinstatement of grazing on scrubland prone to wildfire.

## **5.9 CAP payments for co-operation projects and local partnerships**

Local partnerships play a crucial role in implementing Natura 2000 conservation management on the ground. The EAFRD contains various possibilities to fund farmer action groups, or partnerships between farmer groups and other local organisations, for example local authorities or NGOs, including LEADER, producer groups, and co-operation projects. This range of support includes:

- Co-operation (Pillar 2)
- Local partnerships LEADER (Pillar 2)

### ***Co-operation***

The CAP reform proposal contains an expanded and more flexible measure for co-operative projects<sup>84</sup> to promote short supply chains and local markets, and facilitate collective approaches to environmental projects and environmental practices, from a local to a transnational level. This funding can be combined with funding from other EU sources. Support covers preliminary studies, preparation of management plans, and facilitation and implementation of projects, and the initial seven-year period may be extended in the case of collective environmental projects.

Many environmental priorities require support and management at the wider landscape scale going well beyond the boundaries of individual farms. The effective management of Natura 2000 sites and other protected areas requires joint action between different types of land managers (farmers, forest owners, public authorities managing public land) and this

---

<sup>82</sup> COM(2011) 627 final/3 Article 25

<sup>83</sup> COM(2011) 627 final/3 Article 19

<sup>84</sup> COM(2011) 627 final/3 Article 36

measure could be of particular value in environmentally important areas at risk of economic decline to promote environmental management and economic regeneration.

The reach of agri-environment schemes at the landscape scale can be greatly boosted by regional associations and by the involvement of non-farmer groups, as demonstrated by the Dutch environmental co-operatives (Franks and Mc Gloin, 2007) and the German Land Care Associations. These co-operative associations link nature conservation groups with local farmers and local communities across a region, and can often bring opposing interest groups work together to care for Natura 2000 sites. By pooling interests and local forces the Land Care Associations in Bavaria implement integrated and sustainable land management practices to protect the adopted flora and fauna and to support sustainable development. The local coordinators develop projects for specific landscape types including scientific measures, financial calculations and the implementation of agri-environment schemes. They apply for available funds on the state-level and supervise the implementation of activities, mostly done by local farmers, as well as monitor the project outcome. The basis for successful projects is the close cooperation with farmers, local communities, conservation groups and government authorities. Box 5.7 shows some examples of Natura 2000 co-operation initiatives.

**Box 5.7 Examples of successful co-operation initiatives to promote Natura 2000 products and agro-tourism using LEADER and integrated CAP funding**

Sources: (Beaufoy et al, 2011b; EC, 2009; Keenleyside et al, 2012; Poláková et al, 2011) and [http://www.rudi-europe.net/uploads/media/Case-study\\_Italy\\_1.pdf](http://www.rudi-europe.net/uploads/media/Case-study_Italy_1.pdf), <http://www.herbmedit.org/flora/20-047.pdf>, LIFE04 NAT/IT/000173

**Austrian “Almo Genusregion” – Almenland restaurants and beef marketing**

The Leader+ region "Almenland Teichalm – Sommeralm" in Styria produces excellent quality beef on 3,600 ha of alpine pastures. The Almo, i.e. the ox raised on the areas' alpine pastures, is now a registered trademark and the product is being certified. The LAG is promoting the Almo-region as 'Genusregion' ('region of pleasure') for tourists, and quality restaurants and shops are offering the local Almo beef. Throughout the process an open communication with the local population and a close collaboration between municipalities, farmers, tourist service providers, a regional slaughter house and the producing company has been the key to success. The beef is also now sold on sales stands in about 250 outlets of a national supermarket chain.

**Italian Grosseto province – integrated rural development**

**The Grosseto province in the Tuscan** countryside has taken a strong integrated approach to rural development funding. Agro-tourism visits doubled in Grosseto province between 2000 and 2007. Rural tourism is seen as a channel for promoting local agricultural products as well as the natural and historic heritage. Agricultural added value grew by about 2% per year. At the same time, the area covered by regional protected areas has risen to about 10% of the region, including 3 regional parks and 35 national reserves. The area is also rich in floral biodiversity.

An example of cooperation at a national level can be seen in the Netherlands under the current programming period where collective contracts were introduced for agri-environment applicants. The purpose of these collective contracts was to improve communication between farmers and raise their environmental awareness to strengthen their capacity to deliver environmental benefits through shared best practice. This approach

was also viewed as a more cost effective means of delivering agri-environment objectives. These collective contracts resulted in multiple benefits for biodiversity, in particular for local species such as the hamster and meadow birds and also for landscape features (Allen et al 2012).

### *Local partnerships LEADER (Pillar 2)*

The LEADER approach has a strong potential to use local action groups to deliver innovative projects for training farmers, to implement beneficial land management at a landscape scale, to develop and implement Natura 2000 management plans, and to fund transnational projects aimed at learning about protected habitats that cross borders (Cooper et al, 2006). LEADER complements agri-environment schemes and other nature conservation funding because it focuses on actions strongly rooted in local territories, engages local actors through partnerships, and funds training and innovation.

LEADER has not been used by Member States as a significant funding source for Natura 2000 management measures, but it can potentially provide substantial benefits by promoting co-operation between local actors and developing integrated projects that combine nature conservation and land use in a sustainable way. For example, Finland now offers LEADER funding to NGOs for management of Natura 2000 meadowland and wetlands not owned by professional farmers (Figezky et al, 2010). Some LEADER projects have enhanced the value of Natura 2000 sites through schemes to develop eco-tourism, or programmes to produce and market quality local agricultural products such as beef, supporting traditional farming systems and their associated semi-natural habitats. There is however not much evidence of real achievement for biodiversity on the ground so far (Beaufoy & Marsden, 2010; Cooper et al, 2006; Redman, 2010), and schemes have been criticised for their lack of transparency about procedures and implementation (European Court of Auditors, 2010), and for their failure to include sufficient environmental expertise in the Local Action Groups (Birdlife International, 2009a; Boccaccio et al, 2009)

The LEADER approach incorporates locally driven public-private partnerships, capacity building and targeted management and because of this has particular potential to deliver biodiversity benefits. The proposed new measure<sup>85</sup> now allows Leader Local Actions Groups (LAGs) to carry out tasks delegated to them by the Managing Authority, which opens up the possibility of local delivery of targeted environmental measures. It has been recognised in the current programming period that capacity building is critical for the LEADER approach, and this measure now covers the cost of a LEADER start-up kit, capacity building, training and networking.

The LEADER approach offers a greater degree of local autonomy and flexibility to address both environmental and socio-economic issues than is possible with the conventional 'top-down' delivery of EAFRD support, LEADER funds can be accessed by a wide range of rural stakeholders and therefore offers wider opportunities. In future, LEADER projects could be more targeted towards the goals of Natura 2000 areas, particularly where LEADER is used in combination with other land management measures to deliver environmental priorities. The new thematic structure of EAFRD provides greater encouragement for LEADER groups to

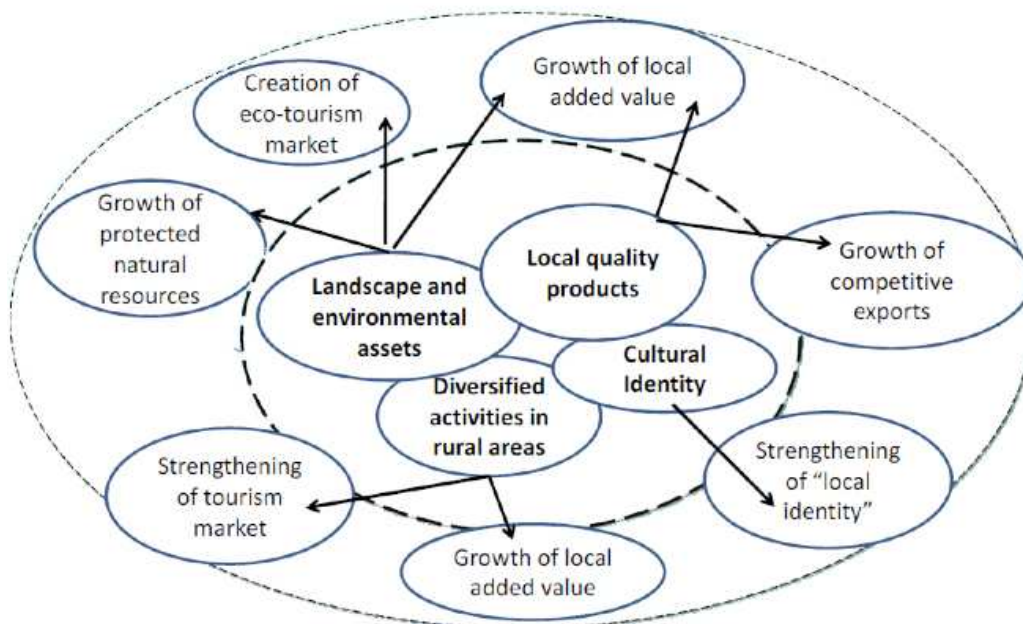
---

<sup>85</sup> COM(2011) 627 final/3 Articles 42-45

engage with land management activities, in contrast to the current period where LEADER activity was sometimes confined to delivery of Axis 3 measures. These measures can be used to support and improve the socio-economic viability of farming on Natura 2000 areas through locally marketing of high value agricultural products, agro-eco-tourism, or other initiatives such as educational or cultural services. Sensitive tourism in Natura 2000 farmland areas can be a vital driver of the local economy and a catalyst for the development of local markets for high quality Natura 2000 agricultural products, and for a revival of other social and cultural initiatives. One key instrument towards that goal is the management planning process for Natura 2000 areas, which integrates the demands of user groups including recreation and tourism and local businesses with appropriate measures for the protection of species and habitat. Figure 5.2 illustrates the wider benefits from a community based approach to Natura 2000 conservation.

Two examples of how LEADER and Local Action Groups (LAG) can support the cross-cutting environmental priorities discussed here can be seen in Poland with the current programming period. *Kraina Łęgów Odrzańskich*: This LAG supports small local projects that maintain and conserve marshland and wetland in protected areas, particularly those that fall within Natura 2000 sites. Local citizens partake in the planning and management. *Wrzosowa Kraina*: This LAG maintains and conserves a local site of environmental importance due to the heather growing there. This LAG provides training, school lessons and communication activities to preserve the area. It also supports local tourism by introducing walking paths to the area. Whilst both of these local initiatives provide multiple benefits for the local environments, most LAGs in Poland do not focus on nature protection. A lesson learnt from this programming period in Poland is that LEADER must be used more widely for the provision of nature conservation.

**Figure 5.2 Positive synergies and benefits that can be gained from Natura 2000 farmland conservation. Based on (Mantino, 2011)**



## 5.10 Other EU funds for Natura 2000

### *LIFE+ Programme*

LIFE+ is the main EU funding instrument dedicated to the promotion of the environment within the EU 27 for the period 2007-2013. The LIFE+ component 'LIFE+ Nature and Biodiversity' supports best practice or demonstration projects that contribute to the implementation of the Birds and Habitats Directives and the Natura 2000 network, and projects related to biodiversity conservation in general. The LIFE programme has played a pivotal role in financing the establishment and initiating management of the Natura 2000 network (COWI, 2009)<sup>86</sup>.

Though the budget of the LIFE+ instrument is small compared to other EU financing instruments (Kettunen et al, 2011), LIFE+ has strategic importance for Natura 2000, because it finances very specific, targeted conservation measures which are more difficult to fund from other EU sources, such as monitoring and surveying, definition and establishment of management techniques, and management of risks to Natura 2000 sites (Gantioler et al, 2010; Kettunen et al, 2011).

LIFE+ funding is particularly important for sites where agricultural management has been abandoned, and Natura 2000 management planning has not progressed far enough to allow application for funding from other sources (Kettunen et al, 2011). Its main purpose is to provide best practice examples, so on-going management activities which are unlikely to be seen as 'best practice' can fall outside the scope of LIFE+. Consequently, the positive effect of the project will be lost if appropriate management is not supported from other sources, particularly agri-environment schemes, after the project ends (COWI, 2009). The development of agri-environment schemes for Natura 2000 management is therefore a priority in LIFE budgeting (European Commission, 2003). Many Natura 2000 restoration projects have successfully combined LIFE funding with the development of agri-environment funding to ensure long-term financial support (WWF and IEEP, 2009). LIFE has financed the development of over a thousand management plans.

The new LIFE Integrated Projects (IPs), included in the proposal for the LIFE fund for 2014-2020<sup>87</sup>, could also prove relevant for Natura 2000 habitat conservation by improving the integration of environmental aspects in other EU policies, and by focusing on the implementation of plans and strategies on a larger territorial scale (e.g. regional, multi-regional, national). Integrated projects should also contribute to mobilise other funding sources to achieve conservation objectives and implement the measures required in Natura 2000 areas.

---

<sup>86</sup> McConville,A.J., Gantioler,S., Medarova-Bergstrom,K., Lewis,M., Bassi,S., Kettunen,M. & ten Brink,P. (2010) Proceedings of the stakeholder conference on financing Natura 2000, Brussels, 15-16 July 2010. [http://ec.europa.eu/environment/nature/natura2000/financing/index\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/financing/index_en.htm)

<sup>87</sup> European Commission (2011) Proposal for a regulation of the European Parliament and of the Council on the establishment of a Programme for the Environment and Climate Action (LIFE). COM(2011) 874 final.

### ***European Structural Funds: Regional Development Fund and Social Fund***

The European Structural Funds, which are the European Regional Development Fund (ERDF), the European Social Fund (ESF), and the European Cohesion Fund, make up over half of the EU central budget.

The aim of the ERDF and ESF is to promote the economic and social development of disadvantaged regions, sectors and social groups within the EU by reducing regional disparities and supporting the structural development and adjustment of regional economies (Farmer, 2011). The European Social Fund (ESF) can support capacity building aimed at the creation of new job opportunities related to Natura 2000, however it does not provide any dedicated objectives directly relevant for biodiversity so it is not possible to track the impacts of expenditure on Natura 2000 (Kettunen et al, 2011).

The ERDF allows for allocation of funds to biodiversity in the measures for promotion of biodiversity and nature protection (code 51), promotion of natural assets, and protection and development of natural heritage (Articles 4(4), 4(6), 5(2)b, 6(2)b)). The funds also allow for allocation of funding to transnational, cross-border and interregional cooperation which can benefit Natura 2000 sites and species, for example projects to develop eco-tourism, and to protect, restore and manage river basins, coastal zones, marine resources, water services and wetlands (Article 6(2)b). It is the Member States' responsibility to decide on the allocation of these funds and Member States prepared national strategic reference frameworks and Operational Programmes for spending funds in the period 2007-2013.

The European Structural Funds can provide significant funding for Natura 2000 restoration, conservation, management and monitoring actions (European Commission, 2011). The funding could also be used to support eco-tourism, awareness-raising and communication, training and education activities in Natura 2000 areas. The majority of regions and Member States include biodiversity as a priority in their Operational Programmes, and most have dedicated funds for code 51 under the ERDF (ie permitting spend on nature conservation and Natura 2000) (INTERREG IVC SURF Nature project, 2011). However, only a small proportion has actually succeeded in allocating a significant part of the budget to nature conservation projects. For example, the Czech Republic obtained 0.7€ million ERDF money for its Natura 2000 network to spend by the end of 2008 (Court of Accounts of France, 2008), and €34m was accessed by Murcia in Spain under code 51 (INTERREG IVC SURF Nature project, 2011). A project in a string of coastal Natura 2000 sites on Tenerife in the Canary Islands used INTERREG funds to finance monitoring and inventory of species and habitats in Natura 2000 sites, as well as the design of site management plans (WWF & IEEP, 2009). Other examples are shown in Box 5.8. In general, it is difficult to get an overview of how much has been spent on Natura 2000 and what impact this has had on biodiversity (Kettunen et al, 2011).

The use of EU structural and regional funds for Natura 2000 management is constrained by the significant investment needed to apply for funds, and the long wait until funds arrive. In general, the funds are only accessible for large-scale projects.

### **Box 5.8 Examples of the use of ERDF funds for Natura 2000 farmland management**

An example of a pioneering use of ERDF funds for Natura 2000 management is the project to implement an Integrated Weser Management Plan for the Weser river estuary, with its 3 SCIs and 3 SPAs, and the estuarine cities of Bremen and Bremerhaven. The ERDF funds were allocated under Priority 2 “To activate the urban economy and quality of life”, for activities to re-naturalise the river shore and improve recreation opportunities, and to restore and manage the river basin<sup>1</sup>. The project is restoring a range of estuary habitats and species in both the Niedersachsen and Bremen Federal States.

The emphasis of the ERDF Interreg Natureship project (Finland, Sweden, Estonia and Latvia) of Central Baltic Interreg IVA Programme is a novel approach on planning and management of traditional rural landscapes and selected coastlines. The aim of the project is to create and restore an optimal ecosystem service network based on integrated sustainable coastal planning. The project will also assess how to achieve cost-effective planning and management of traditional rural biotopes of city areas in order to enhance public and biodiversity values.

TIDE (Tidal River Development) is an ERDF Interreg project which covers the estuaries of the Rivers Elbe (Germany), Humber (England), Scheldt (Belgium and the Netherlands) and Weser (Germany) and brings together experts, scientists, policy-makers and managers representing economic, social and environmental interests in the four estuaries. The aims of TIDE are to identify knowledge gaps in hydrology, morphology and ecology, integrate planning in local policy whilst ensuring that Natura 2000 and Water Framework Directive requirements are met, and define the most important ecosystem services in each estuary and then relating this to benefits. A budget of €3.7 million is available, 50 per cent of which is derived from the European Regional Development Fund, financed through the Interreg IV B North Sea Programme, and 50% is paid by the partners.

Source: (Hjerp et al, 2011)

## **5.11 Market-based instruments and innovative instruments**

This section reviews instruments that can be used to leverage private financing for Natura 2000 management, and/or increase the economic viability of Natura 2000 management. These initiatives often benefit from EU funds under one or more of the previously described measures, in order to help set up the scheme. A range of other potential measures exist through which public funding and/or policy actions can potentially stimulate increased private sector funding of biodiversity, often in combination with public funding, for example from not-for profit organisations (e.g. NGOs, foundations), philanthropic donations by companies, or from rural communities. There is also a key potential for micro-finance for pro-biodiversity local businesses and co-operatives, such as direct marketing initiatives. The added value offered by visitors and tourists in Natura 2000 areas could also be captured more effectively through integrated local development and conservation projects. An important consideration is that these measures should generally be able to build on the foundation set by the basic policy framework and core public funding measures for Natura 2000 farmland management described in the previous sections, rather than being considered as alternatives.

### *Payments for Ecosystem Services schemes*

Payments for Ecosystem Services schemes are arrangements in which the beneficiaries of ecosystem services pay the providers of those services to maintain them (TEEB, 2011). The payments can therefore provide an incentive for the conservation and restoration of biodiversity and habitats in order to safeguard (or potentially increase) the provision of the ecosystem services it provides. Typical ecosystem services that PES schemes are designed to support are groundwater quality, river water quality (restricting nutrient run-off and soil erosion), and carbon sequestration. PES schemes can operate between land managers or farmers and public organisations (such as municipal water companies) or private businesses (such as breweries), and may operate at the local, regional, river catchment or national scale. A range of different financing and payment mechanisms are referred to as PES schemes, including tax incentives, voluntary markets and broad public measures such as agri-environment schemes, but in this section we refer only to PES systems based on direct payments between beneficiaries and providers.

PES schemes are sometimes criticised as being disguised subsidies to encourage compliance with existing standards and laws that land managers and farmers should be meeting without extra payments, such as management measures to restrict nitrate emissions. Factors that are critical for the success of PES schemes in Europe therefore include ensuring that:

- The scheme design is based on robust information on the baseline status of land use and ecosystem services, in order to avoid overestimating the environmental threat;
- All key stakeholders participate in the scheme;
- The payments are tied to regular and transparent monitoring of indicators that adequately measure improvement in the ecosystem service(s);
- the scheme is not used to pay for management practices that ought to be carried out to meet legal obligations;
- the scheme is adjusted whenever existing regulations and norms are tightened up;
- the scheme is not being undermined by conflicting policies and regulations that are driving the deterioration of ecosystem services.

Successful schemes require transparency, reliability (e.g. of payments), acceptance of environmental stewardship values, trust, and strong commitment by all key stakeholders. In practice, PES schemes will only be able to halt degradation or loss of ecosystem services and biodiversity if they are embedded in a broader mix of policy instruments that address the full range of ecosystem services from an area (TEEB, 2011).

Payments for Ecosystem Services schemes other than broad public funding schemes are still relatively uncommon, but the success of some schemes show the potential they have to support and improve the management of Natura 2000 farmland. For example, the

Sustainable Management Catchment Programme (SCaMP)<sup>88</sup>, developed by a UK water company in association with the RSPB, applies a Payment for Ecosystem Services scheme to the maintenance of grazing on upland heathland. The water company benefits from improved water quality by reducing erosion of the peat soils from burning and over-grazing (see this case study in Annex E for further details).

### **Carbon offsetting and protection of carbon-rich habitats**

There are now voluntary and regulated carbon trading schemes operational throughout Europe that mean stored carbon, if verified, could have an economic and tradeable value (Worrall et al, 2009). This means that new income streams could become available for land management. The legal protection of carbon-rich habitats may also be strengthened in the near future as EU Member States start accounting for emissions/removals from land use, land use change and forestry (LULUF) in their national carbon budgets (eg see section 5.4 for proposed CAP cross-compliance standard). At the same time, these habitats are being strongly affected by both land use change and climate change (Holden et al, 2007; Reed et al, 2009).

Fens and heaths on intact peat soils could benefit from funding from carbon offsetting. A UK study modelled the carbon benefits of targeted management interventions on upland peatlands, and estimated that given present costs of peatland restoration and value of carbon offsets, perhaps 51% of those upland areas where a carbon benefit was estimated would show a profit from carbon offsetting within 30 years (Worrall et al, 2009). However, this percentage is very dependent upon the price of carbon used.

### **Further information**

- Legal proposals for the CAP after 2013:
  - European Commission (2012). *Proposal for a regulation of the European Parliament and of the Council establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy*. COM(2011) 625 final/3 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0625:REV2:EN:PDF>)
  - European Commission (2012). *Proposal for a regulation of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)*. COM(2011) 627 final/3 ([http://eur-lex.europa.eu/smartapi/cgi/sga\\_doc?smartapi!celexplus!prod!DocNumber&lg=EN&type doc=COMfinal&an doc=2011&nu doc=627](http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=EN&type doc=COMfinal&an doc=2011&nu doc=627))
  - European Commission (2012). *Proposal for a regulation of the European Parliament and of the Council on the financing, management and monitoring of the common agricultural policy*. COM(2011) 628/3

---

<sup>88</sup> <http://www.unitedutilities.com/scamp.aspx>

- Addressing biodiversity and habitat preservation through measures applied under the Common Agricultural Policy CAP and biodiversity. Report prepared for the European Commission, DG Agriculture and Rural Development. Institute for European Environmental Policy (IEEP), London, 2011:  
[http://ec.europa.eu/agriculture/analysis/external/biodiversity-protection/index\\_en.htm](http://ec.europa.eu/agriculture/analysis/external/biodiversity-protection/index_en.htm)
- Fit for the environment: principles and environmental priorities for the 2014 - 2020 Rural Development Programmes. Report produced for the RSPB. Institute for European Environmental Policy (IEEP), London, 2012  
([http://www.ieep.eu/assets/985/IEEP\\_2012\\_Fit\\_for\\_the\\_environment.pdf](http://www.ieep.eu/assets/985/IEEP_2012_Fit_for_the_environment.pdf))

## 6. DESIGN AND IMPLEMENTATION OF MEASURES TO SUPPORT NATURA 2000 FARMLAND MANAGEMENT

### ***What does this chapter do?***

*This chapter provides a guide to the process of planning, funding and implementing support for farming systems and communities on which the conservation of key Natura 2000 species and habitats depends. The focus is on the key source of funding Pillars 1 and 2 of the CAP with recommendations for each stage of the process.*

### **6.1 Strategic planning and prioritisation of conservation objectives and funding**

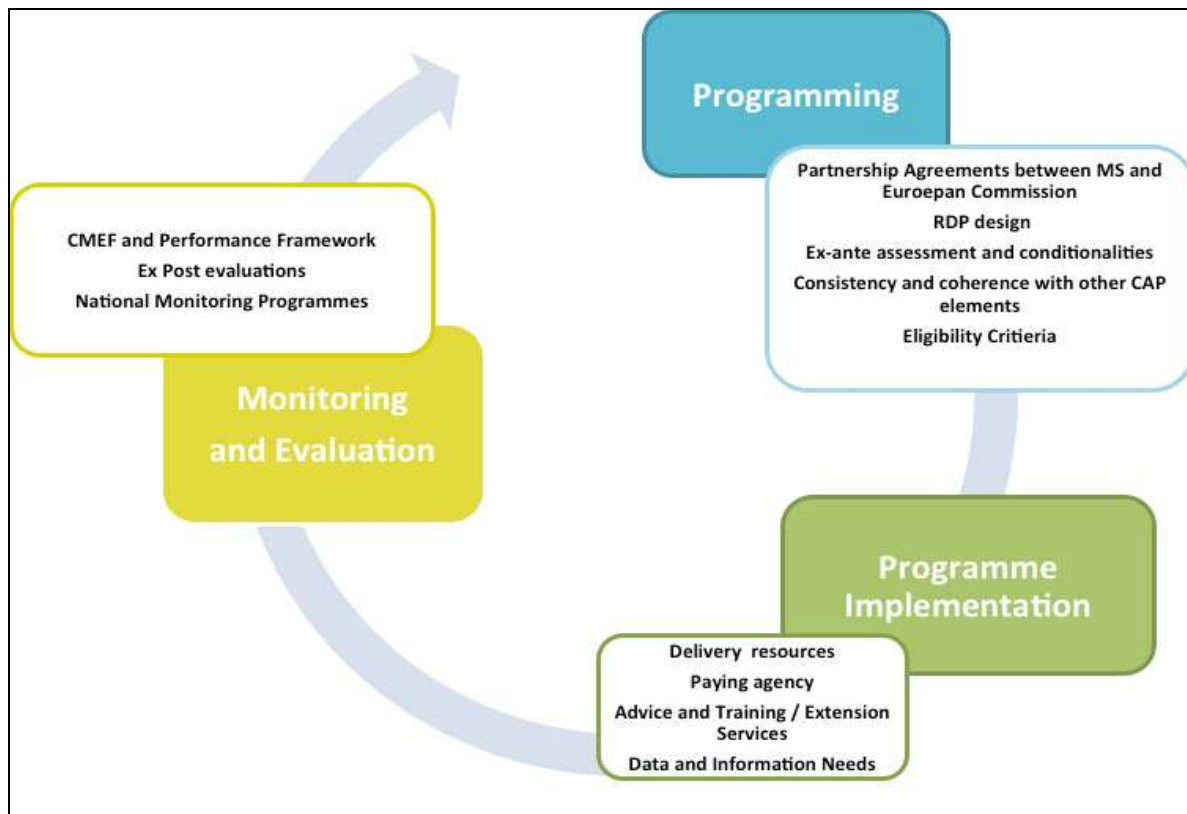
Strategic planning is important to establish conservation priorities and funding needs for Natura 2000 farmland before the start of the 2014-20 programming period. This is important because funding resources are limited, biodiversity conservation has to compete with many other objectives, and priorities for national and EU funding will be established early in the programming process. Strategic planning for Natura 2000 farmland should be a co-operative process involving the environmental and agricultural authorities and key stakeholders.

#### **Recommendations:**

- Ensure cooperation between nature and agriculture authorities and relevant stakeholders in strategic planning for Natura 2000
- Set clear strategic objectives and priorities for conservation of key habitats and species that depend on Natura 2000 farmland
- Use the prioritized action framework (PAF) as the basis for integrating Natura 2000 financing priorities into EAFRD and other funding programmes.
- Take timely action to ensure that Natura 2000 objectives and funding needs for 2014-20 from EAFRD and the Cohesion Funds are embedded in the legally binding Partnership Agreement between the Member State and the European Commission.

Essential steps for strategic planning and programming, and securing 2014-20 funding are described below. The programme process for RDPs is illustrated in Figure 6.1.

**Figure 6.1. A typical rural development programming cycle**



### **Set clear conservation objectives for Natura 2000 farmland**

Strategic planning needs to set clear conservation objectives and priorities at the national and/or regional level, taking into account the conservation status of key agricultural habitats and species, their representation in the country or region, and other relevant aspects. It is important to support existing farming systems that are preserving habitat quality, not just the areas of Natura 2000 farmland that hold significant proportions of key habitats and species and are at risk from pressures for intensification or abandonment. This may be done taking into account the assessment of the conservation status of habitats and species from Article 17 reporting, and data on pressure indicators such as those relating to the risk of abandonment.

Conservation objectives may be set at regional or national levels, and then translated into site level, i.e. to the Natura 2000 sites where the target habitats and species are present (see also section 3.1 on setting conservation objectives). Different management approaches are needed in different agricultural and conservation status situations, from maintenance of existing farming practices to habitat restoration and reinstatement of management on abandoned land.

Not all sites will require a site management plan, as approaches to management planning of Natura 2000 sites vary in different Member States, but it is always necessary to establish the necessary conservation measures for all Special Areas of Conservation, in accordance with article 6.1 of the Habitats Directive (see section 3.1). It is important to identify the status of

farmland habitats and species, the conservation objectives and provide guidance on appropriate management options. It is possible to use RDP funding to support the process of preparing and updating of *'protection and management plans relating to Natura 2000 sites and other areas of high nature value'*<sup>89</sup> (see section 5.8 for details)

The areas targeted and overall uptake of measures also needs to maintain and/or enhance sufficient coherent habitat to enable the species to maintain or build up a viable population (Whittingham, 2007). Therefore, targeting only the areas that currently hold populations may not be sufficient to ensure long-term conservation success (RSPB & Birdlife International, 2011).

It is important also to embed Natura 2000 policy objectives in regional sustainable development strategies. Natura 2000 farmland communities can also benefit from initiatives such as ecotourism, adding value to agricultural products from Natura 2000 farmland, quality labels, and support for direct marketing structures. In some cases market-based schemes implementing Payments for Ecosystem Services have shown potential to support conservation management. Long-term protection of Natura 2000 biodiversity may also require regeneration of cultural and social capital, taking advantage of the environmental values, knowledge, and skills that exist within farming communities. This can include recognising increased ecological expertise of land managers through awards and publicity, and encouraging farmer cooperatives or associations to facilitate Natura 2000 management and gain added benefits.

***Integrate Natura 2000 farmland conservation objectives into relevant strategic policies and programmes and ensure adequate funding***

It is crucial to identify the financial resources to support the management of Natura 2000 farmland and ensure the long-term economic survival of the farming systems on which they depend. The identification of the necessary conservation measures in management plans and other instruments is just the start of the process.

Many Member States are currently preparing their Prioritized Action Frameworks for financing Natura 2000, which will identify the strategic priorities, the measures required for the 2014-2020 programming period and the funding instruments that may be used to implement those measures (see also section 3.3).

Securing EU co-financing for 2014-20 requires timely action before the relevant operational programmes are prepared. The essential first step is to ensure that Natura 2000 objectives and funding priorities for 2014-20 are embedded in the legally binding Partnership Agreement between the Member State and the European Commission that will set the priorities for use of the Structural and Cohesion Funds, including the European Agricultural Fund for Rural Development (EAFRD) and the European Regional Development Fund (ERDF), for the next seven years.

---

<sup>89</sup> COM(2011) 627/3 Article 21 (1)(a)

### ***Box 6.1 Integration of Natura 2000 into EU funding programmes***

In the current financial framework, some countries have already developed interesting approaches to the integration of Natura 2000 financial needs into relevant EU programmes. For instance, the Slovenian “Natura 2000 Site Management Programme 2007-2013” is a notable example of a national level integrated approach to Natura 2000 conservation planning (Republic of Slovenia Ministry of the Environment and Spatial Planning, 2007). The programme developed detailed conservation objectives, measures to achieve those objectives, and monitoring and research proposals, for all Natura 2000 habitats, species and sites in Slovenia. This was prepared in cooperation with relevant public services, ministries and others, with knowledge of the legislative framework and the register of land use, and based on expert groundwork and scientific knowledge. At the same time, measures were included into the Rural Development Plan 2007-2013 and the Slovenian regional development programme. The programme analysed the financial needs for Natura 2000 management and detailed the use of both EU funds and national funds.

Other Member States are also using the integrated approach; for example England and Wales have recently secured LIFE+ funding for integrated Natura 2000 management planning.

## **6.2 Identifying Natura 2000 farmland and farming systems, and engaging with the farmers**

### **Recommendations:**

- Identify the extent and location of Natura 2000 farmland, including land used by farmers but not recorded by the agricultural authorities as part of the Utilised Agricultural Area; recently abandoned farmland; and land outside the Natura 2000 site which is an integral part of the farming system using the Natura 2000 land (for example lowland winter pasture for livestock that graze Natura 2000 habitats in summer)
- Assess the current situation of Natura 2000 farmland, the economic viability of the Natura 2000 farming systems and the key pressures and drivers of change in land management or land use
- Engage the farmers and local communities in this information gathering process and develop a partnership approach that involves them fully in the process of designing, delivering and monitoring support measures for their farming systems and the rural economy

### ***Identify the extent and location of Natura 2000 farmland***

In most Member States the existing agricultural databases (such as LPIS) that record the land and farmers eligible for CAP support are almost certainly an incomplete record of Natura 2000 farmland. It is therefore essential to work with local experts, the farmers themselves and both environmental and agricultural authorities to identify the actual extent and location of Natura 2000 farmland. Resources such as habitat and species records, and land cover imaging may help but local knowledge is essential.

Natura 2000 farmland is likely to include land used by farmers but not currently recorded by the agricultural authorities as part of the Utilised Agricultural Area (for a variety of reasons); recently abandoned farmland; and land outside the Natura 2000 site that is an integral part of the farming system of the Natura 2000 land (for example the lowland hay meadows or pastures that provide winter fodders for livestock that graze Natura 2000 habitats in summer).

It is also important to identify land used by farmers but owned by others, such as common land, and arable or pastureland that for part of the year is grazed by landless graziers. In some of the New Member States cadastre records of land use may be out of date and record agricultural land as forest, for example. Recording the extent and location of the farmland is the first, essential, step in securing support payments and the information should be compiled in a GIS format that can easily be updated and is compatible with the LPIS system used by the agricultural authorities. The important issue of ensuring that this land is actually eligibility for payments is discussed in section 6.4 below.

***Assess the current situation of Natura 2000 farming and its economic viability, and identify the key drivers of change***

To be able set appropriate targets, prioritize actions and design programmes that will improve the conservation status of key agricultural habitats and species, Member States need to conduct their own national and/or regional analysis of the current state of their Natura 2000 farming systems. In particular this should consider the economic viability of the extensive farming systems and the drivers and pressures for change that they face, now and in the future. Uneconomic farms are particularly vulnerable to quite small changes in their circumstances, which can lead to major changes in land use and management. The analysis should identify areas that are at risk from pressures for intensification or abandonment, but it is just as important to identify the existing farming systems that are preserving species and habitats, such as HNV farming areas (see also sections 2.4 and 2.5 on key drivers and pressures).

***Engage farmers and local communities and develop a partnership approach to planning, design and delivery of support measures***

Integrated management of farmland in Natura 2000 areas requires not just the active cooperation of agriculture and nature/environmental authorities, at national and regional levels, in the definition of strategic priorities and the design of appropriate measures, but local co-operation too. Developing suitable instruments and measures must involve farmers and land managers in scheme design and delivery. This is essential in designing support mechanisms are fit for purpose at local scales, and are fully accepted and used by the local communities. There is increasing evidence of farmers wanting to have a say in designing the support measures and that this leading to successful outcomes (Polakova et al. 2011).

The mechanism of getting people together is however often overlooked in policy and funding instruments, and so remains under-recognised and under resourced. As a result there remains in some communities a strong distrust of Natura 2000. This can only be overcome by ensuring a more systematic approach to ensuring dialogue and cooperation at local level to local organisations/ partnerships that bring the different parties together to

discuss at a practical level how to integrate all interests (as is done systematically now in France through the *local comités*). It is possible to use RDP funding to support this process (see section 5.9 for details).

The partnership principle is already embedded in rural development policy, with a requirement on Member States and regions to involve relevant social, economic and other appropriate body (including environmental organisations) in all aspects of the preparation, implementation, monitoring and evaluation of RDPs. The proposed general regulation for 2014-2020 requires that ‘partners’ shall be involved at each stage of the programme cycle and shall be members of the monitoring committee.

Local partnerships to implement Natura 2000 on the ground can make the difference between a relatively low level of success and real achievement of both favourable conservation status and socio-economically viable farming. Agricultural and nature conservation authorities, NGOs, farmers and other stakeholders are increasingly working in partnerships to develop land management schemes in Natura 2000 sites, and a feeling of collective responsibility and local ownership is one of the most important success factors for site management.

Natura 2000 designation has often generated fears and misunderstandings, but there are some good examples where use conflicts have been successfully resolved by a partnership approach at the local scale and different measures have been successfully combined to create a situation where farming Natura 2000 habitats is socio-economically viable.

***Box 6.2. Tailoring measures to the local conditions with the participation of farmers and land managers***

***Farming for Conservation in the Burren (Ireland)***

A notable example of agricultural measures highly tailored to the preservation of particular habitats is found in the Natura 200 sites in the Burren area, where traditional practice of winter grazing by cattle, known as ‘winterages’, has been long valued for its capacity to maintain the rich diversity of species and habitats existing in the area. A specific agreement tailored for the Burren under the main agri-environment programme in Ireland was applied in the area since 1995. Then a pilot scheme funded with LIFE (‘BurrenLIFE’) developed a model of sustainable agriculture based on the implementation of farm plans that were revised annually, following in-depth consultation between the farmer and the project team.

Based on those previous experiences, the Burren Farming for Conservation Programme (BFCP), has been funded since 2009 under Pillar 1 of the CAP, using Article 68(1)(a)(i) of EU Regulation 73/2009. While participants are provided with advice on how to maximise the environmental benefit from their land (via a site visit, development of farm plans and provision of best practice guidance), farmers are expected to use their own initiative to create the optimal crop of species-rich grasslands. Actions and priorities are therefore suggested by the farmer; the BFCP team (funded by the National Parks and Wildlife Service) will then advise on which actions the scheme can support. The innovative compensation arrangements developed for the scheme are considered key to achieving the outcomes desired. All works are proposed by the farmer and individually mapped and costed by a trained advisor. Farm plans are now quite simple and clear, made up of just 2-sides of A3; one side has a map of the farm identifying important habitats, cultural features and proposed actions, and the other a list of actions with a costing attached to each one.

### ***Grassland management in the Krkonoše National Park (Czech Republic)***

Since 2010, grassland habitats are managed according to the Management Plan of the National Park and the SCI Krkonoše that define conservation priorities and agricultural practices for the following ten years. According to the plan, favourable conservation status of grasslands (habitats and species) should be maintained as well as connectivity and coherence of existing ecosystems.

A pilot initiative to develop a model of “nature-friendly management” at the farm level has been developed in the Park; it aims to maintain and improve the status of habitats through farming that is economically viable and well adapted to local conditions. The objective is also to harmonise measures for the protection of different species and habitats on farm level and to avoid biodiversity degradation due to inappropriate farm practices supported from various policy instruments (e.g. removal of shrubs under AEM could be harmful for certain butterflies). The measures are defined in farm plans and are targeted to species rich grasslands and to selected species of national and European importance (e.g. *Crex crex*). The farm plan describes the natural values present on the farm and defines detailed management prescriptions for each polygon of farmland. A list of available measures will be based on existing agrienvironmental measures, accompanied by specific measures for grasslands and arable land. As regards the measures, emphasis is put particularly on more flexible late mowing, diverse grazing regimes, support of partial (strip, mosaic) mowing, decrease of livestock per hectare, and support of exceptions from general rules with permission of a nature conservation authority. The plan may include specific prescriptions for the protection of certain insect species (e.g. parcels without management), for bird protection on meadows (e.g. mowing from centre), or on arable land (e.g. decrease use of fertilisers), etc. An efficient advisory system and regular communication with farmers contributed to increase the environmental awareness.

*See case studies in Annex E for further details*

### **6.3 Ensuring eligibility for CAP support and setting the reference level**

#### **Recommendations:**

Through joint working and close co-operation between the environmental agricultural authorities:

- ensure that the Natura 2000 farmland identified is classed as part of the UAA and is recorded in the LPIS/IACS systems
- use the flexibility available to agricultural managing authorities in the CAP regulations to ensure that Natura 2000 farmers using this land are eligible for both Pillar 1 and Pillar 2 CAP support
- if necessary define GAEC standards and other CAP eligibility rules specifically for HNV and/or Natura 2000 farmland
- ensure there is a clear distinction, readily understood by farmers, between a) legal obligations placed on farmers by national or regional legislation linked to Natura 2000 implementation; b) other national or regional legislation; and c) SMR and GAEC cross-compliance requirements

### ***Ensure eligibility for CAP support, using flexibility available in the CAP regulations***

It is important that that Natura 2000 farmland is classified as part of the UAA, not just for eligibility for CAP payments, particularly for income support under Pillar 1, but because one of the proposed indicators used by the Commission to evaluate of the impact of Member States' use of EAFRD funds is 'the percentage of the UAA farmed to generate High Nature Value'<sup>90</sup>. Land not recognised as UAA will be excluded from this assessment of the effectiveness of EAFRD funding, making it more difficult to justify funding in the next programming period.

All agricultural habitats and the associated farmland should be entitled to Pillar 1 payments, so resolving the issues around eligibility for these habitats is a priority (see Section 5.4 for discussion of eligibility problems and ways of resolving them).

The agricultural authorities managing CAP and EAFRD funding at Member State or regional level have the responsibility for defining and applying rules on eligibility for CAP payments and for maintaining records and monitoring expenditure. It is absolutely essential that there is close and timely co-operation between Natura 2000 and the agricultural authorities to ensure that eligibility issues are satisfactorily resolved before proposals for the next programming period are finalised and submitted for Commission approval. There is considerable flexibility inherent in the CAP draft regulations to accommodate the particular needs of Natura 2000 farmers, but there is no obligation on the authorities to use it for that purpose (and often pressure from other agricultural sectors to define rules that fit best the larger more intensive farming systems).

Particular attention should be paid to farmers using other farmers' land on an informal basis or for only part of the year; to farmland with complex land tenure systems, such as communal use; and to the many Natura 2000 grazed habitats that have a significant proportion of trees and shrubs which contribute to their biodiversity value, but have been excluded from payment in the past.

### ***Setting the reference level for payments***

In the next programming period the reference level for CAP income support, agri-environment and other land-based payments will change, with revisions to GAEC and SMR in the cross-compliance framework (which will have to be reflected in the verifiable standards defined at national or regional level by individual Member States) and the introduction of the new 'green' Pillar 1 payments (although the impact of these on Natura 2000 farms may be lessened if Natura 2000 farmland is treated in the same way as organic farmland).

As with eligibility for CAP payments there is a great deal of flexibility in the way in which GAEC standards can be defined, and Member States are required to take account of local conditions, which means that there should be no barrier to defining a separate set of GAEC standards for HNV and Natura 2000 land. Again this will require close and timely co-operation between the agricultural and environmental authorities on both defining new cross-compliance standards and setting legal obligations on farmers for management of

---

<sup>90</sup> EC (2012) Impact Indicators for the CAP post 2013. DG Agriculture, Directorate L.

Natura 2000 land. For the latter it is particularly important that these are not so demanding that they set the baseline for agri-environment-climate payments so high that farmers are not eligible, and the legal obligations act as a driver of abandonment. Although farmers can be compensated for these legal requirements, these payments are not able to support positive restoration management to the same extent as agri-environment-climate payments, they cannot be matched to the needs of individual farms or habitats and there is no provision to pay the farmers' transaction costs.

#### **6.4 Designing and targeting coherent packages of CAP support for Natura 2000 farms**

##### **Recommendations:**

- Adopt an inclusive partnership approach to designing Natura 2000 support measures, fully involving the target farmers and making use of their expert knowledge of farm and habitat management.
- Design coherent, integrated packages of support from both Pillars of the CAP to address the specific needs of Natura 2000 farming systems and the key habitats and species that they manage. These should meet local needs to support:
  - the continuation of farming
  - extensive farming systems
  - capacity building and adding value to farm produce
  - agricultural management of Natura 2000 habitats and species.
- Ensure that small farmers are able to access easily the appropriate support from both Pillars of the CAP.
- Make use of the new thematic RDP sub-programme options for mountain farms and small farms to devise specific Natura 2000 options, with higher rates of support.
- Ensure that payments rates for Areas with Natural Constraints (ANC), Natura 2000 and agri-environment-climate measures reflect the full cost of management, especially where there is little or no income to forgo, and use the option for adding transaction costs to these calculations, where available.
- Make cost-effective use of available funding by designing and targeting support as closely as possible to farm and habitat requirements, at the appropriate spatial scale.
- Make full use of opportunities to use group and co-operative approaches, especially where multiple small farms are involved and to encourage 'bottom up' delivery through LEADER.

##### ***Designing coherent, integrated packages of support***

Once the targets and conservation objectives and needs have been identified at the relevant scale, it will be necessary to develop and select the appropriate instruments and management measures to achieve those objectives. Being clear about the objectives is

critical to designing policy responses that both address the issues and ensure coherence between different measures, particularly in relation to their eligibility criteria and management requirements.

To meet the specific needs of Natura 2000 farming systems and the key habitats and species that depend on them it is necessary to design coherent, integrated packages of support from both Pillars of the CAP. Income support payments of several types will be available from Pillar 1, and the proposed new structure of the EAFRD makes it very much easier to design coherent packages of RDP support for the 2014-20 programming period (in contrast to the current RDPs where support for economic, environmental and social objectives can be combined only by using LEADER).

At present many Natura 2000 farming systems are the 'poor relation' of the CAP system, with incomplete access to fragmented sources of support and low levels of payment. Extensive farming systems that provide Natura 2000 habitats need to be economically and socially viable, and this depends on farms receiving an adequate and reliable baseline of CAP income support payments and support for capacity building, as well as payments that can address the specific management needs of certain habitat and species. The design process should take a holistic view of the needs of these farms to build up a coherent package of four related types of support:

- to ensure that farming continues on the Natura 2000 land
- to support the extensive farming systems associated with the key species and habitats
- to build capacity and add value to farm produce, to improve economic sustainability
- to support specific conservation management of Natura 2000 habitats and species

The logical structure of this hierarchy of coherent support is first to secure the farming system and its economic viability, then to provide incentives for the very detailed habitat and species management. The range of potential measures to meet these needs is illustrated in Table 6.1 below, and each of these measures is described in Chapter 5. The choice of measures is quite wide and will depend on the strategic objectives, the characteristics of the Natura 2000 farming systems, the threats they face and the opportunities available within the rural economy.

It is important to adopt an inclusive partnership approach to designing Natura 2000 support measures. Successful schemes need to combine some top-down strategic planning with bottom-up development of appropriate practical management measures. It is also important to incorporate local knowledge in the design of conservation measures, fully involving the target farmers and making use of their understanding of farm and habitat management.

It is particularly important to ensure that small farmers are able to access payments from both Pillars of the CAP. The issue of eligibility has been discussed above, but some of these farmers may be completely unfamiliar with the administrative system. It is very important that support is available to them from a trusted source in a form and a place that is easily accessible, for example one-to-one advice in a local office.

The proposed new thematic RDP sub-programme options for Member States include a focus on mountain farms and on small farms, with integrated programmes of support and higher rates of payment. There is opportunity to develop specific measures within these sub-programmes for Natura 2000 and other HNV farming systems, which could be flagged up in the Partnership Agreement with the European Commission and fully developed in the RDP.

**Table 6.1 Potential CAP support measures for Natura 2000 farming systems and management** (measures shown in bold are compulsory for Member States)

Objective	Pillar 1	Pillar2
<i>Ensure that farming continues</i>	<b>Basic Payment Scheme</b>  <b>Green payment</b>  <b>Small Farmers Scheme</b>	
<i>Support extensive farming systems</i>	ANC payment  Coupled payments (c.f. Art.68)	ANC compensation payment  Organic farming
<i>Build capacity and add value</i>	<b>Young Farmers Scheme</b>	Advisory services  Knowledge transfer and information  Investment in physical assets  Farm and business development  Setting up producer groups  Quality schemes for agricultural products
<i>Specific conservation management of Natura 2000 habitats and species</i>		<b>Agri-environment-climate</b>  Non-productive investments  Natura 2000 compensation  Animal welfare payments  Prevention of forest fires and restoring agricultural potential

### **Payment calculations for ANC and agri-environment-climate payments**

Setting payment rates is critical to successful uptake of environmental land management payments in RDPs, because farmers will not apply for schemes if they perceive the payments rates to be too low. The payment system needs to be transparent and

accountable in order to build trust with farmers, conservation organisations, and the general public.

The formula for payment calculation is (income foregone + costs incurred + transaction costs<sup>91</sup>) and the data used should correspond to the cost of current normal farming practices and conservation work in the area where the scheme is implemented. This means that payments for the same type of measure can vary considerably from place to place, depending on circumstances. It is very important ensure that payment rates for ANC, Natura 2000 and agri-environment-climate measures reflect the full cost of management, especially where there is little or no income to forgo. Transaction costs should be added to these calculations, as these can be a considerable demand on farmers' time in highly targeted schemes like those in Natura 2000 areas, and for farmers who do not have administrative support. Member States must respect the maximum payment rates set out in the regulation, unless they can justify higher rates, which may occasionally be the case in some Natura 2000 areas especially if these are at risk of abandonment.

### **Box 6.3 Using local knowledge to develop agri-environment support for key species**

Balancing the different management requirements for different species and habitats on a Natura 2000 site can be very complex, but the traditional agricultural management in areas where the species and habitats survive can provide the solutions that are well adapted to the local needs. For instance, floodplain grasslands in Slovakia host several butterfly species included in the Habitats Directives, as *Maculinea teleius*, *M. nausithous*, and *Lycaena dispar*, which are closely connected with traditionally used alluvial meadows. These species were adapted to traditional mosaic mowing as the site was never mown at once. Mosaic management is also important for *Crex crex* especially in the years with shorter flood periods.

In contrast, other bird species of European importance like *Lanius collurio* or *Ciconia nigra* may benefit from large-scale mowing, because freshly mown grasslands are very attractive food sources. Agri-environment measures have been used to develop schemes in specific locations for particular species, for example the Little Bustard (*Tetrax tetrax*) (France), the common hamster (*Cricetus cricetus*) in the Netherlands and Germany or the Corncrake (*Crex crex*) in Scotland (UK) (see for example RSPB and BirdLife International, 2011).

### **Targeting and scale**

For RDP support it is important make cost-effective use of available funding by designing and targeting support as closely as possible to farm and habitat requirements and at the appropriate spatial scale.

Horizontal measures may be useful in some situations for certain habitat types or species where a few simple requirements can be applied across the whole farmed landscape in a region or country, as in the case of grasslands conservation in Slovakia or Baltic meadows in Estonia (see Box 6.4 and case studies in annex E for further details).

---

<sup>91</sup> this is an additional amount of up to 30%, depending on the scheme

**Box 6.4 Strategic approaches aimed at wide-scale conservation of particular habitats**

***Cooperation between Ministries of Environment and Agriculture for Boreal Baltic coastal meadows in Estonia***

In 2001, the Estonian Ministry of Environment launched a national scheme for the restoration and management of the Baltic coastal meadows. The first step was to restore these meadows to a level where they could once again be regularly grazed and mowed. The restoration work was mainly done by local landowners and farmers who entered into management contracts with the Ministry of Environment. Later on, the Ministry of Agriculture developed a dedicated agri-environment scheme for semi-natural habitats under Estonia's RDP Programme (2007- 2013). Many of the farmers who had started with the Ministry of Environment's scheme subsequently joined the RDP scheme.

The agri-environment scheme targeted a much larger area than the Ministry of Environment scheme, and covered not just Baltic coastal meadows, but also other types of semi-natural habitats such as wet meadows, wooded meadows, wooded pastures, alvar habitats, flooded meadows and fen meadows, juniper thickets, heaths and grasslands on mineral soil – all of which are habitats of high nature value and protected under the Habitats Directive. The scheme is managed by the Ministry of Agriculture in close cooperation with the State Nature Conservation Centre, which comments on, and approves, each agri-environment application. The close cooperation of the two Ministries is a major element of success. Around half of all the coastal meadows in Estonia have been included in the agri- environment scheme so far.

***National programme for semi-natural grassland in Slovakia***

Slovakia has developed a national programme of agri-environmental measures (AEM) for supporting extensive farming on semi-natural grasslands over the whole country. The Programme defines particular agricultural practices for specific habitat types grouped into seven categories: Dry Grasslands, Mesoic grasslands, Mountain hay meadows, Wet grasslands of lower altitudes, Alluvial Cnidion grasslands, Wet grasslands of higher altitudes, Fen and Molinia meadows and High-mountain grasslands.

These habitat types were defined on a national level according to the National Grassland Inventory (Šeffler et al. 2002). Slovakia's grassland inventory is not only one of the best developed in Europe, but also the one best integrated into agri-environment support, though it needs to be updated. The AEM for semi-natural grassland now only supports areas recognised as having a minimum biodiversity value (High Nature Value), including Natura 2000 sites. The AEM also covers the specific needs of each Natura 2000 site.

*See case studies in Annex E for further details.*

For many situations more specific local approaches may be required in certain areas, eg. including highly tailored and targeted measures that are best suited to the specific management needs of a particular species or habitat in a particular location. Targeting is likely to be very important for many Natura habitats and species as these may not always be effectively conserved by broad-scale (eg national) agri-environment measures that primarily aim to maintain a habitat in general terms. For example, the Slovakian semi-natural grassland schemes found that horizontal measures were not very effective as different species and habitats often have different conservation needs, and these may also vary locally. The scheme therefore aims to improve its effectiveness by developing more specific measures that are targeted to priority areas (eg Natura sites) with management prescriptions agreed (and monitored) at field levels where necessary. Bottom-up design of

measures through locally coordinated dialogue with farmers is therefore required to achieve this.

Targeting of agri-environment type measures clearly requires reliable, up-to-date and extensive ecological data (eg inventories, habitat maps and species atlases), and therefore surveys need to be carried out and records to be compiled and mapped. Such actions can be costly, and may require considerable investments to increase the capacity of nature conservation organisations. But such actions are likely to be cost-effective if they reduce the area over which measures need to be applied to achieve a desired conservation outcome.

Many land management schemes, to be effective, require significant uptake at the wider landscape scale and joint action between different types of land managers (farmers, forest owners, public authorities managing public land). Managing authorities should therefore collaborate with a wide range of stakeholders, including the farming and forestry communities in the design of their RDPs and make best use of the opportunities in the regulation to facilitate and support landscape scale uptake.

***Box 6.5 Co-operative agri-environment support for extensive sheep grazing in Bavaria***

It may sometimes be more efficient to encourage farmers to group together in cooperatives or associations in order to sign agri-environment agreements, rather than signing agreements with individual farmers. In the Altmühltal Natura 2000 dry grassland region in Bavaria, Germany, Landcare Associations have been crucial for the support of the sheep farmers, who coordinate extensive grazing by around 25,000 sheep and produce certified Altmühl-valley lamb<sup>92</sup>. Coordination between farmers is also necessary to ensure that management measures are not carried out synchronously in all areas, eg mowing, so that there is enough heterogeneity in the habitat that all species benefit.

***Groups and co-operative approaches and LEADER***

Group and co-operative approaches to delivering RDP measures can be particularly useful for Natura, especially where multiple small farms are involved. For example, in Romania the organisation Fundația ADEPT works with small-scale farmers in the Târnava Mare Natura 2000 site to bring them into support schemes and encourage improvements in scheme design to ensure accessibility for small-scale farmers (see case study from Romania in annex 3). The role of facilitators or a coordinating organisation is particularly important in group agreements.

The involvement of non-farmer groups, and a ‘bottom up’ approach to delivery of locally targeted schemes can both be supported through LEADER. The Dutch environmental co-operatives illustrate this well (Franks & Mc Gloin, 2007) as do the German Land Care Associations (see Box 6.6). These co-operative associations link nature conservation groups with local farmers and local communities across a region, and can often bring opposing interest groups work together to care for Natura 2000 sites. The basis for successful projects is the close cooperation with farmers, local communities, conservation groups and government authorities.

<sup>92</sup> <http://www.mulewf.rlp.de/natur/naturschutz/partnerbetrieb-naturschutz/>

**Box 6.6 Landcare Asociations (LCA) working with farmers and local communities in Germany**

The Landcare Asociations (LCA) in Germany are working on the implementation of suitable agricultural measures in Natura 2000 in cooperation with farmers and local communities. These regional non-governmental associations link nature conservation groups with local farmers and local communities. 155 Landcare associations (at least one in every federal state) are working on a district level together with 20,000 farmers, more than 3000 local authorities and 1000 NGOs. These often opposing interest groups are working together to implement integrated and sustainable land management practices in many Natura 2000 sites. Local Landcare coordinators in LCAs develop projects for specific landscape types including scientific measures, financial calculations and the implementation of agri-environment schemes. They apply for available funds on the state-level and supervise the implementation of activities, mostly done by local farmers, as well as monitor the project outcome. The basis for successful projects is the close cooperation with farmers, local communities, conservation groups and government authorities. The implementation of suitable measures in Natura 2000 areas is based on the combination of three main elements: 1) Direct Payments, 2) Agri-environmental Programs, 3) Land Management Programs to preserve the Natural Heritage based on the current Article 57 of the EU Agricultural Financing.

(See also case studies in Annex E)

**6.5 Securing financial, technical, advisory and administrative resources for implementation**

**Recommendations:**

- ensure that sufficient financial and other resources are available for long-term support, including trained advisory and paying agency staff with the technical expertise required for Natura 2000 land management.
- Advice and information should be delivered by sources trusted by the farmer.

Funding under RDPs needs to be on a long-term basis if at all possible, as gaps in funding erode confidence amongst farmers and landowners and dissuade them from taking on long-measures (such as habitat restoration). If long-term funding is not available farmers will tend to focus on measures that can be easily reversed, which in some cases will result in the permanent loss of benefits that may have been built up over the course of a scheme. This will reduce the long-term benefits of public expenditure.

It is essential to secure funding not just for payments to farmers but also to cover all the delivery and support costs. Some of these costs are co-financed by the EAFRD, for example advisory services, training and skills acquisition (including training the advisers and trainers), preparation of Natura 2000 and HNV management plans, group facilitation and LEADER. In many cases these services are delivered by contractors to government, including NGOs and farmer organisations (see chapter 5 for details).

In allocating resources to delivery of Natura 2000 support it is important to recognising the proportionally higher burden of institutional transaction costs where large numbers of small

farmers are involved, and where both farmers and delivery staff are involved for the first time. Specialist training in Natura 2000 management and farming systems will be required for delivery staff and especially for paying agency staff responsible for compliance, who will decide whether farmers have met the requirements of cross-compliance and their agri-environment contracts, and therefore can be paid.

Advice and information should be delivered by sources trusted by the farmer (otherwise it is likely to be ignored) and should always integrate advice on conservation with advice on how this can be accommodated within the farming system. Box 6.5 shows some examples of integrated advice.

Funding should be made available for monitoring the impacts of management activities at farm level.

***Box 6.7 Integrated agricultural and conservation advice for farmers in Germany and the Netherlands***

***The “Partnerbetrieb Naturschutz” programme***

The “Partnerbetrieb Naturschutz” initiative offers farmers integrated agricultural and conservation advice for the whole farm and dialogue-based planning. The advisory teams include both the consultants who administer the agri-environment schemes under contract to the Rheinland-Pfalz Ministry of Environment, Farming, Food, Winegrowing and Forestry (MULEWF), and the agronomic advisors of the six regional Agricultural Public Service Centers (Dienstleistungszentren für den ländlichen Raum DLR).

The farmer and the advisory team carry out a dialogue and situation analysis of the whole farm and its surrounding landscape. A conservation plan is developed for the whole farm, including an analysis of the farm’s conservation potential and farm-specific conservation objectives, using maps and aerial photos and land designations, with a special focus on Natura 2000 habitats and species and conservation objectives under the Water Framework Directive. The farmer and advisory team then develop and agree on a farm-specific conservation plan. The team offers an ongoing one-to-one advisory service, evaluation and feedback. Results are jointly measured and evaluated by the farmer and team annually.

Farmers are looking for answers that are specific to their farm, such as what effect will extensive pasture management have on the farm’s milk production? What is the point of a certain management measure? What is the impact of not doing something? What environmental resources, habitats or species can I conserve on my farm? Providing convincing answers is a key element in building trust in proposed conservation measures.

(See further details in the description of this case study in Annex E)

### **Box 6.8 *Farmers and researchers collaborate for hamster conservation in the Netherlands***

Hamster-friendly management has been implemented in the Netherlands with an effective collaboration of farmers and researchers. Direct and continuing advice and one-to-one support to farmers has significantly contributed the success of the project. During the project, the researchers informed and helped farmers with crop management and other hamster aspects, answering questions such as “Is it possible to harvest?” or “I have found a burrow, what should I do?”. A hamster coordinator carries out the monitoring, checks calls for new management agreements, and checks compliance with the crop management measures.

Research results and flexible management regulations allowed adaptive management. The management advice was altered significantly during the project as a consequence of increased insights from the hamster monitoring research carried out by Alterra, Wageningen & Radboud University Nijmegen. The management flexibility was possible because the project was officially an experiment under EU-regulations, allowing the involved parties to change regulations and management prescriptions. For example, a 20 m survival stripe was agreed in yearly contracts, so each year researchers could approach farmers who had the optimal location to benefit hamsters

(See further details in the description of this case study in Annex E).

## **6.7 Monitoring, evaluation and review**

### **Recommendations:**

- Monitor uptake and coverage of the measures in relation to each relevant Natura 2000 habitat and species, check against targets, and review the scheme design and delivery if targets are not being met.
- Ensure data gathering systems are embedded in scheme delivery processes from the outset
- Ensure sufficient capacity to monitor and evaluate outcomes.
- Specify desired outcomes or ‘milestones’ and define adequate monitoring procedures and indicators that can be easily applied and understood by farmers.
- Involve farmers in monitoring and communicate the results and the main conclusions of the corresponding evaluations to them.

Effective monitoring and evaluation is critical to being able to assess the effectiveness and efficiency of measures in delivering their objectives, and to allow schemes and management practices to be adapted and refined over time.

Monitoring and evaluation must be carried out at different levels. Regular monitoring should be an integral part of every agri-environmental programme. Monitoring should allow assessing the uptake and coverage of the measures, any possible difficulties and constraints

for their implementation, as well as their impact in relation to the pursued conservation objectives.

It is important to design monitoring schemes that can also be applied at farm level using suitable indicators that can be easily verified. Involving farmers in regular monitoring of the results achieved through their implementation of the required measures has proved to be very effective and a ways to improve their participation in the implementation of the schemes. Wider public communication is also very important to create a positive image of the target species and habitats, and recognise those who make efforts to protect them.

The Member States should integrate the results of regular monitoring reports from Natura 2000 into financing mechanism and re-target existing policy instruments accordingly. This specifically requires the integration of Natura 2000 monitoring results into agricultural policy measures that have direct impact on Annex species and habitat of Natura 2000. In order to establish effective implementation of integrated programme of combined measures, it is crucial to develop a **common data information system** gathering agricultural, botanical, zoological and land users data available for Natura 2000 sites.

Monitoring of RDPs is established through a 'performance framework' designated in the common provisions regulations<sup>93</sup>. A suite of indicators specific to the CAP as a whole, and rural development policy in particular are established through the Common Monitoring and Evaluation Framework (CMEF). These must be applied in all RDPs, although Member States are also able to put in place additional indicators relevant to their national/regional situation. Within this required framework, there is an impact indicator '*the percentage of the UAA farmed to generate High Nature Value*'<sup>94</sup>, which will help to assess how well Natura 2000 priorities have been integrated into implementation of RDP measures over the seven year period. In addition to these formal evaluation requirements, 'fast track' internal review processes during the first two years of a support scheme can provide a very effective way of identifying and resolving problems before these can affect implementation or environmental effectiveness.

At the national or regional level, the main aim of monitoring and evaluation activities is to provide feedback to scheme managers and policy-makers on how well an agri-environment scheme is functioning and whether it is achieving its objectives. This is effectively part of an 'active learning process' that enables the Managing Authority to review and revise existing schemes and measures, and improve the design of future schemes and measures. Where Natura 2000 management schemes are being introduced for the first time, small-scale pilot testing and evaluation can improve the efficiency, acceptance and delivery of the schemes.

---

<sup>93</sup> Article 19 and Annex I of the proposed General regulation

<sup>94</sup> EC (2012) Impact Indicators for the CAP post 2013. DG Agriculture, Directorate L.

## REFERENCES

- Allen, B, Buckwell, A, Baldock, D and Menadue, H (2012a) *Delivering environmental benefits through ecological focus areas*. Report commissioned by the Land Use Policy Group, Institute for European Environmental Policy, London, UK.
- Allen, B, Keenleyside, C, Menadue H. (2012b) *Fit for the environment: principles and environmental priorities for the 2014-2020 Rural Development Programmes*. Report produced from the RSPB. Institute for European Environmental Policy, London, UK.
- Angileri, V (2011) *Farm Advisory System in the EU: proposals for improvement*. Results of the FAS workshop, Warsaw 8-9 February 2011. Warsaw.
- Apostolopoulou, E and Pantis, J (2009) Conceptual gaps in the national strategy for the implementation of the European Natura 2000 conservation policy in Greece. *Biological Conservation*, No 142, (1) pp221-237.
- Baines, D and Summers, R W (1997) Assessment of bird collisions with deer fences in Scottish forests. *Journal of Applied Ecology*, No 34, (4) pp941-948.
- Baines, D and Andrew, M (2003) Marking of deer fences to reduce frequency of collisions by woodland grouse. *Biological Conservation*, No 110, (2) pp169-176.
- Barnes, A P, Schwarz, G, Keenleyside, C, Thomson, S, Waterhouse, T, Polokova, J, Stewart, S and Cracken, D (2011) *Alternative payment approaches for non-economic farming systems delivering environmental public goods. Final report for Scottish Natural Heritage, Scottish Environment Protection Agency, Countryside Council for Wales and Northern Ireland Environment Agency, May 2011*. Scottish Agricultural College; Institute for European Environmental Policy; Johann Heinrich von Thünen Institut.
- Batáry, P, Báldi, A and Erdos, S (2007a) Grassland versus non-grassland bird abundance and diversity in managed grasslands: local, landscape and regional scale effects. *Biodiversity and Conservation*, No 16, (4) pp871-881.
- Batáry, P, Báldi, A, Szél, G, Podlussány, A, Rozner, I and Erdos, S (2007b) Responses of grassland specialist and generalist beetles to management and landscape complexity. *Diversity and Distributions*, No 13, (2) pp196-202.
- Baur, B, Cremene, C, Groza, G, Rakosy, L, Schileyko, A A, Baur, A, Stoll, P and Erhardt, A (2006) Effects of abandonment of subalpine hay meadows on plant and invertebrate diversity in Transylvania, Romania. *Biological Conservation*, No 132, (2) pp261-273.
- Beaufoy, G and Marsden, K (2010) *CAP Reform 2013: last chance to stop the decline of Europe's High Nature Value farming?* Joint position paper by EFNCP, BirdLife International, Butterfly Conservation Europe and WWF. European Forum on Nature Conservation and Pastoralism, Derwentside, UK.

Beaufoy, G, Jones, G, Kazakova, Y, McGurn, P, Poux, X and Stefanova, V (2011b) *Permanent Pastures and Meadows under the CAP: the situation in 6 countries*. European Forum for Nature Conservation and Pastoralism (EFNCP) and the Grasslands Trust, Derwentside.

Beaufoy, G, Jones, G, Kazakova, Y, McGurn, P, Poux, X and Stefanova, V (2011a) *Permanent Pastures and Meadows: adapting CAP Pillar 1 to support public goods*. European Forum for Nature Conservation and Pastoralism (EFNCP) and the Grasslands Trust, Derwentside.

Bergmeier, E, Petermann, J and Schröder, E (2012) Geobotanical survey of wood-pasture habitats in Europe: diversity, threats and conservation. *Biodiversity and Conservation*, No 19, (11) pp2995-3014.

Beynon, S.A, Mann, D.J, Slade, E.M and Lewis, O.T (2012) Species-rich dung beetle communities buffer ecosystem services in perturbed agro-ecosystems. *Journal of Applied Ecology*, 49:1365–1372.

BfN (2011) Fauna-Flora-Habitatrichtlinie Und Vogelschutzrichtlinie - Gebiete Und Arten in Deutschland. Bundesamt fuer Naturschutz <http://www.ffh-gebiete.de/>

Birdlife International (2004) *Birds in the European Union: a Status Assessment*. Birdlife International, Wageningen, Netherlands.

Birdlife International (2009) *Through the green smokescreen - How is CAP cross-compliance delivering for biodiversity?* BirdLife International, Brussels.

Boccaccio, L, Brunner, A and Powell, A (2009) *Could Do Better - How is EU Rural Development Policy Delivering for Biodiversity?* Birdlife International, Brussels.

Bota, G, Morales, M B, Mañosa, S and Camprodon, J (eds) (2005) *Ecology and Conservation of Steppe-Land Birds*. Lynx Edicions & Centre Tecnològic Forestal de Catalunya, Barcelona, Spain.

Buckingham, D L, Atkinson, P W, Peel, S and Peach, W (2010) New conservation measures for birds on grasslands and livestock farms, in *BOU Proceedings - Lowland Farmland Birds III: delivering solutions in an uncertain world*. pp 60.

Caballero, R and Fernández-Santos, X (2009) Grazing institutions in Castilla-La-Mancha, dynamic or downward trend in the Spanish cereal-sheep system. *Agricultural Systems*, No 101, (1-2) pp69-79.

Calaciura, B and Spinelli, O (2008) *Management of Natura 2000 Habitats: 5210 Arborescent matorral with Juniperus spp*. Technical Report 2008 10/24, European Commission, Brussels.

Campbell, L H, Avery, M I, Donald, P, Evans, A D, Green, R E and Wilson, J D (1997) *A review of the indirect effects of pesticides on birds*. 227, JNCC Report, Joint Nature Conservation Committee, Peterborough.

Catry, I, Amano, T, Franco, A M A and Sutherland, W J (2011) Influence of spatial and temporal dynamics of agricultural practices on the lesser kestrel. *Journal of Applied Ecology*, No 10.1111/j.1365-2664.2011.02071.x,

CEEweb (2011) Natura 2000 Implementation Fact Sheets. CEEweb  
<http://www.ceeweb.org/workinggroups/natura2000/resources/index.html>

Ceulemans, T, Merckx, R, Hens, M and Honnay, O (2012) Plant species loss from European semi-natural grasslands following nutrient enrichment - is it nitrogen or is it phosphorus? *Global Ecology and Biogeography*, No in press,

Christin, M-S, Gendron, A D, Brousseau, P, Menard, L, Marcogliese, D J, Cyr, D, Ruby, S and Fournier, M (2009) Effects of agricultural pesticides on the immune system of *Rana pipiens* and on its resistance to parasitic infection. *Environmental Toxicology*, No 22, (5) pp1127-1133.

Cizek, O, Zamecnik, J, Tropek, R, Kocarek, P and Konvicka, M (2012) Diversification of mowing regime increases arthropods diversity in species-poor cultural hay meadows. *Journal of Insect Conservation*, No 16, (2) pp215-226.

Clothier, L and Finch, E (2012) *The farm practices survey 2009 uplands and other less favoured areas (LFAs) survey report*. Agricultural Change and Environment Observatory Report No. 16, Department for Environment, Food and Rural Affairs, London.

Cooper, T, Baldock, D, Rayment, M, Kuhmonen, T, Terluin, I, Swales, V, Poux, X, Zakeossian, D and Farmer, M (2006) *An Evaluation of the Less Favoured Area Measure in the 25 Member States of the European Union*. A report for DG Agriculture. Institute for European Environmental Policy, London.

Cop, J, Vidrih, M and Hacin, J (2009) Influence of cutting regime and fertilizer application on the botanical composition, yield and nutritive value of herbage of wet grasslands in Central Europe. *Grass and Forage Science*, No 64, (4) pp454-465.

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Consolidated version 1.1.2007.

[http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index\\_en.htm](http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm)

Council Directive 2009/147/EC on the conservation of wild birds, codified version of Directive 79/409/EEC. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF>

Court of Accounts of France (2008) *Report on implementation of the NATURA 2000 Network in Europe*. Court of Accounts of France, Paris, France.

COWI (2009) *Ex-post evaluation of projects and activities financed under the LIFE programme*. Final Report. Part 1: Methodology and description of the LIFE programme and its policy context. COWI, Kongens Lyngby, Denmark.

Cumulus Consultants (2011) *High Nature Value farmland in Rural Development policy: South Devon Case Study*. Report for European Forum on Nature Conservation and Pastoralism. CC-P-504.2, European Forum on Nature Conservation and Pastoralism, Derwentside, UK.

Dänhardt, J, Green, M, Lindström, Å, Rundlöf, M and Smith, H G (2010) Farmland as stopover habitat for migrating birds - effects of organic farming and landscape structure. *Oikos*, No 119, (7) pp1114-1125.

Delgado, A and Moreira, F (2000) Bird assemblages of an Iberian cereal steppe. *Agriculture Ecosystems and Environment*, No 78, (1) pp65-76.

Dover, J, Spencer, S, Collins, S, Hadjigeorgiou, I and Rescia, A (2011) Grassland butterflies and low intensity farming in Europe. *Journal of Insect Conservation*, No 15, (1) pp129-137.

DVL and NABU (2009) Integration naturschutzfachlich wertvoller Flächen in die Agrarförderung. Fallstudien zu den Auswirkungen der Agrarreform. DVL-Schriftenreihe Heft 16. Ansbach, Deutschland, Deutscher Verband für Landschaftspflege (DVL) e.V. & Naturschutzverbund Deutschland (NABU-Bundesverband). Landschaft als Lebensraum.

EC (2009) Commission Staff Working Document. Peak Performance. New insights into mountain farming in the European Union. SEC (2009) 1724 FINAL, 16.12.2009, European Commission, Brussels.

EC (2010) Report from the Commission to the Council and the European Parliament on implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources for the period 2004-2007. COM(2010)47, 9.2.2010, European Commission, Brussels.

Ecologic (2006a) *Case Study 'Diepholzer Moorschnucke' (Diepholz moor sheep)*. Institut für Internationale und Europäische Umweltpolitik, Berlin.

Ecologic (2006b) *Case Study Summary: Idiazabal*. Ecologic, Berlin.

EEA (2010) *EU 2010 Biodiversity Baseline*. EEA Technical Report No 12/2010, European Environment Agency, Copenhagen.

ENRD (2010) *Semi-subsistence farming in Europe: concepts and key issues*. Background paper prepared for the seminar "Semi-subsistence farming in the EU: Current situation and future prospects" Sibiu, Romania, 21st - 23rd April 2010. European Network for Rural Development, Brussels.

Eriksson, M O G (2008a) *Management of Natura 2000 Habitats: 6450 Northern Boreal alluvial meadows*. Technical Report 2008 18/24, European Commission, Brussels.

Eriksson, M O G (2008b) *Management of Natura 2000 Habitats: 9070 Fennoscandian wooded pastures*. Technical Report 2008 21/24, European Commission, Brussels.

Eriksson, M O G and Rosén, E (2008c) *Management of Natura 2000 Habitats: 6280 Nordic alvar and precambrian calcareous flatrocks*. Directive 92/43/EEC on the conservation of

natural habitats and of wild fauna and flora. Technical Report 2008 16/24, European Commission, Brussels.

ETC/BD (2008b) Habitats Directive Article 17 Technical Report (2001-2006). European Topic Centre on Biological Diversity <http://bd.eionet.europa.eu/article17>

European Commission (2000) *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*. Office for Official Publications of the European Communities, Luxembourg.

European Commission (2002) *Assessment of plans and projects significantly affecting Natura 2000 sites*. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg.

European Commission (2003) *LIFE and agri-environment supporting Natura 2000. Experience from the LIFE programme*. European Union, Luxembourg.

European Commission (2007) *Interpretation Manual of European Union Habitats - EUR27*. Natura 2000. European Commission, Brussels.

European Commission (2009) *Composite report on the conservation status of habitat types and species as required under Article 17 of the Habitats Directive*. Report from the Commission to the Council and the European Parliament Composite, COM(2009)358 final, 13.7.2009, Commission of the European Communities, Brussels.

European Commission (2010a) *Action Plan for the Conservation of the Danube Clouded Yellow Colias myrmidone in the European Union*. Species Action Plan. P Marhoul & M Olek (eds), EUSAP, European Commission, Brussels.

European Commission (2010b) *Report from the Commission to the European Parliament and the Council on the application of the Farm Advisory System as defined in Article 12 and 13 of Council Regulation (EC) No 73/2009*. COM(2010)665, 15.11.2010c, European Commission, Brussels.

European Commission (2010c) *Commission Staff Working Document Consolidated Profile. Accompanying document to the report from the Commission to the Council and the European Parliament. The 2010 assessment of implementing the EU Biodiversity Action Plan*. SEC, SEC(2010)1163 final, 8.10.2010b, European Commission, Brussels.

European Commission (2011) *Commission staff working paper Financing Natura 2000. Investing in Natura 2000: Delivering benefits for nature and people*. SEC(2011) 1573 final, 12.12.2011

[http://ec.europa.eu/environment/nature/natura2000/financing/docs/financing\\_natura2000.pdf](http://ec.europa.eu/environment/nature/natura2000/financing/docs/financing_natura2000.pdf)

European Commission, 2012. Rural Development in the EU Statistical and Economic Information Report 2012

European Court of Auditors (2010) *Implementation of the LEADER Approach for Rural Development*. Special Report No 5/2010, European Court of Auditors, Luxembourg.

Farmer, A (ed) (2011) *Manual of European Environmental Policy*. 1 ed. Taylor and Francis, London.

Figeczky, G, Leitao, D, Martini, M, Postulka, Z, Ratarova, V, Veistola, T and Dossche, V (2010) *What changes are needed? The implementation of EU's rural development policy*. FERN, Brussels.

Firbank, L, Petit, S, Smart, S, Blain, A and Fuller, R (2008) Assessing the impacts of agricultural intensification on biodiversity: a British perspective. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*, No 363, pp777-787.

Franks, J and Mc Gloin, A (2007) Environmental co-operatives as instruments for delivering across-farm environmental and rural policy objectives: Lessons for the UK. *Journal of Rural Studies*, No 23, (4) pp472-489.

Gantioler, S, Rayment, M, Bassi, S, Kettunen, M, McConville, A, Landgrebe, R, Gerdes, H and ten Brink, P (2010) *Costs and Socio-Economic Benefits associated with the Natura 2000 Network*. Final Report to the European Commission, DG Environment on Contract ENV.B.2/SER/2008/0038, Institute for European Environmental Policy / GHK / Ecologic, Brussels.

García-González, R (2008) *Management of Natura 2000 Habitats: 6170 Alpine and subalpine calcareous grasslands*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 11/24, European Commission, Brussels.

Geiger, F, Bengtsson, J, Berendse, F, Weisser, W W, Emmerson, M, MORALES, M B, Ceryngier, P, LIIRA, J, Tschardt, T, Winqvist, C, Eggers, S, Bommarco, R, Pärt, T, Bretagnolle, V, Plantegenest, M, Clement, L W, Dennis, C, Palmer, C, Oñate, J J, Guerrero, I, Hawro, V, Aavik, T, Thies, C, Flohre, A, Hänke, S, Fischer, C, Goedhart, P W and Inchausti, P (2010) Persistent negative effects of pesticides on biodiversity and biological control potential on European farmland. *Basic and Applied Ecology*, No 11, (2) pp97-105.

Gibson, D J (2009) *Grasses and Grassland Ecology*. Oxford University Press, Oxford.

Gilbert-Norton, L, Wilson, R, Stevens, J R and Beard, K H (2010) A meta-analytic review of corridor effectiveness. *Conservation Biology*, No 24, (3) pp660-668.

Goßler, P (2009) *Integration von Landwirtschaft und Naturschutz: Das Modellvorhaben "Partnerbetrieb Naturschutz" Rheinland-Pfalz*. Trierer Arbeitsbericht zur Stadt- und Wirtschaftsgeographie 3. Kultur- und Regionalgeographie, Universität Trier, Germany.

Grodzinska-Jurczak, M and Cent, J (2011) Expansion of nature conservation areas: problems with Natura 2000 implementation in Poland? *Environmental Management*, No 47, (1) pp11-27.

- Güthler, W and Oppermann, R (2005) *Agrarumweltprogramme und Vertragsnaturschutz weiter entwickeln*. Mit der Landwirtschaft zu mehr Natur: Ergebnisse des F+ E-Projektes. Heft 13, Bundesamt für Naturschutz, Bonn - Bad Godesberg.
- Halada, L, Evans, D, Romão, C and Petersen, J-E (2011) Which habitats of European importance depend on agricultural practices? *Biodiversity and Conservation*, No 20, (11) pp2365-2378.
- Hart, K and Baldock, D (2011) *Greening the CAP: Delivering Environmental Outcomes through Pillar One*. Institute for European Environmental Policy, London.
- Hart, K, Rayment, M and Lee, H (2010) *Achieving a Transition Away from CAP Direct Payments*. Paper prepared by IEEP for the Land Use Policy Group, Institute for European Environmental Policy and LUPG, London.
- Houghton, A J, Bell, J R, Boatman, N D and Wilcox, A (2001) The effect of the herbicide glyphosate on non-target spiders: Part II. Indirect effects on *Lepthyphantes tenuis* in field margins. *Pest Management Science*, No 57, (11) pp1037-1042.
- Hjerp, P, Medarova-Bergstrom, K, Skinner, I, ten Brink, P, Medhurst, J, Hausemer, P, Peterlongo, G, Kalinka, P, Kettunen, M, Cachia, H, Grubbe, M and Evers, D (2011) *Cohesion Policy and Sustainable Development. A report for DG Regio*. Final Report. Institute for European Environmental Policy, London.
- Holden, J, Chapman, P J and Labadz, J C (2004) Artificial drainage of peatlands: hydrological and hydrochemical processes and wetland restoration. *Progress in Physical Geography*, No 28, (1) pp95-123.
- Holden, J, Shotbolt, L, Bonn, A, Burt, T P, Chapman, P J, Dougill, A J, Fraser, E D G, Hubacek, K, Irvine, B, Kirby, M J, Reed, M S, Prell, C, Stagl, S, Stringer, L C, Turner, A and Worrall, F (2007) Environmental change in moorland landscapes. *Earth-Science Reviews*, No 82, pp75-100.
- Houston, J A (2008) *Management of Natura 2000 Habitats: 2190 Humid dune slacks*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 05/24, European Commission, Brussels.
- Humbert, J Y, Ghazoul, J and Walter, T (2009) Meadow harvesting techniques and their impacts on field fauna. *Agriculture, Ecosystems & Environment*, No 130, (1-2) pp1-8.
- ICNB (2006) *Plano Sectorial da Rede Natura 2000*. Instituto da Conservação da Natureza e da Biodiversidade, Lisbon, Portugal.
- IEEP and Veenecology (2005) *Land abandonment, biodiversity and the CAP*. Outcome of an international seminar in Sigulda, Latvia, 7-8 October 2004. Institute for European Environmental Policy, London / Brussels.
- IEEP & Alterra (2010) *Reflecting environmental land use needs into EU policy: preserving and enhancing the environmental benefits of "land services": soil sealing, biodiversity corridors,*

*intensification / marginalisation of land use and permanent grassland*. Final report to the European Commission, DG Environment on Contract ENV.B.1/ETU/2008/0030. Institute for European Environmental Policy, London.

INTERREG IVC SURF Nature project (2011) *European Regional Development Funding for biodiversity*. An analysis of selected operational programmes. INTERREG IVC, Vienna, Berlin.

IUCN (2011) IUCN European Red List of Threatened Species. Version 2011.2.

<http://www.iucnredlist.org/initiatives/europe>

Keenleyside, C and Tucker, G M (2010) *Farmland Abandonment in the EU: an Assessment of Trends and Prospects*. Report for WWF. Institute for European Environmental Policy, London.

Keenleyside, C, Allen, B, Hart, K, Menadue, H, Stefanova, V, Prazan, J, Herzon, I, Clement, T, Povellato, A, Maciejczak, M and Boatman, N D (2012) *Delivering environmental benefits through entry-level agri-environment schemes in the EU*. Report Prepared for DG Environment, Project ENV.B.1/ETU/2010/0035. Institute for European Environmental Policy, London.

Kettunen, M, Terry, A, Tucker, G and Jones, A (2007) *Guidance on the maintenance of landscape connectivity features of major importance for wild flora and fauna. Guidance on the implementation of Article 3 of the Birds Directive (79/409/EEC) and Article 10 of the Habitats Directive (92/43/EEC)*. Institute for European Environmental Policy, Brussels.

Kettunen, M, Baldock, D, Gantioler, S, Carter, O, Torkler, P, Arroyo Schnell, A, Baumueller, A, Gerritsen, E, Rayment, M, Daly, E and Pieterse, M (2011) *Assessment of the Natura 2000 co-financing arrangements of the EU financing instrument*. A project for the European Commission - final report. 138 pp. + Annexes, Institute for European Environmental Policy, Brussels, Belgium.

Keulartz, J (2009) European nature conservation and restoration policy – problems and perspectives. *Restoration Ecology*, No 17, (4) pp446-450.

King, M (2010) *An investigation into policies affecting Europe's semi-natural grasslands*. A report by the Grasslands Trust. European Forum on Nature Conservation and Pastoralism; European Commission (DG Environment), Derwentside, UK.

Küster, H and Keenleyside, C (2009) The origin and use of agricultural grasslands in Europe, in P Veen, R Jefferson, J de Smidt, & van der Straaten (eds) *Grasslands in Europe of High Nature Value*, pp9-14. KNNV Publishing, Zeist, The Netherlands.

Lemus, J A, Bravo, C, García-Montijano, M, Palacín, C, Ponce, C, Magaña, M and Alonso, J C (2011) Side effects of rodent control on non-target species: Rodenticides increase parasite and pathogen burden in great bustards. *Science of the Total Environment*, No 409, (22) pp4729-4734.

McConville, A J., Gantioler, S, Medarova-Bergstrom, K, Lewis, M, Bassi, S, Kettunen, M and ten Brink, P. (2010) Proceedings of the stakeholder conference on financing Natura 2000, Brussels, 15-16 July 2010

Middleton, B, Grootjans, A P, Jensen, K, Venterink, H O and Margóczy, K (2006) Fen Management and Research Perspectives: An Overview. Bobbink, R, Beltman, B, Verhoeven, JTA, and Whigham, DF. Wetlands. Functioning, Biodiversity Conservation, and Restoration. [191], 247-268. New York, Springer-Verlag. ECOLOGICAL STUDIES.

Morris, A J, Wilson, J D, Whittingham, M J and Bradbury, R B (2005) Indirect effects of pesticides on breeding yellowhammer (*Emberiza citrinella*). *Agriculture Ecosystems and Environment*, No 106, pp1-16.

Nitsch, H (2006) *MEACAP WP5 Case study on genetic resources in food and agriculture*. Dissemination level: non-public. 6th Framework Programme SPECIFIC TARGETED RESEARCH PROJECT n°SSPE-CT-2004-503604.

Nitsch, H, Osterburg, B, Roggendorf, W and Laggner, B (2012) Cross compliance and the protection of grassland - Illustrative analyses of land use transition between permanent grassland and arable land in German regions. *Land Use Policy*, No 29, (2) pp440-448.

Nori, S and Gemini, M (2011) The Common Agricultural Policy vis-a-vis European pastoralists: principles and practices. *Pastoralism: Research, Policy and Practice*, No 1, (1) 27.

Oñate, J J, Atance, I, Bardají, I and Llusia, D (2007) Modelling the effects of alternative CAP policies for the Spanish high-nature value cereal-steppe farming systems. *Agricultural Systems*, No 94, (2) pp247-260.

Oppermann, R (2009) *Common Agricultural Policy: Cross-compliance and the Effects on Biodiversity*. Results of a research project and recommendations for the further development of the agricultural policy. R Oppermann (ed), Institut für Agrarökologie und Biodiversität (IFAB), Mannheim, Germany.

Oppermann, R and Spaar, R (2003) Artenreiches Grünland - Lebensraum für Wiesenbrüter, in R Oppermann & H U Gujer (eds) *Artenreiches Grünland Bewerten Und Fördern*, pp128-133. Verlag Eugen Ulmer, Stuttgart.

Oppermann, R, Beaufoy, G and Jones, G (2012). High Nature Value Farming in Europe. 35 European countries - experiences and perspectives. Ubstadt-Weiher, verlag regionalkultur.

Orbicon, Écosphère, ATECMA, Ecosystems LTD (2009) *How species conservation can be supported through rural development programmes: Good practice examples*. Wildlife and sustainable farming and the Birds and Habitats Directives. Orbicon, Ecosphere, ATECMA, & Ecosystems LTD (eds), Wildlife and Sustainable Farming Initiative, Brussels.

Osterburg, B, Isermeyer, F, Lassen, B and Röder, N (2010) Impact of economic and political drivers on grassland use in the EU, in *Grassland Science in Europe*, pp14-28. Grassland in a

Changing World: 23rd General Meeting of the European Grassland Federation, 29.8.2010, Kiel, Germany. European Grassland Federation, Göttingen.

Papanikolaou, A D, Fyllas, N M, Mazaris, A D, Dimitrakopoulos, P G, Kallimanis, A S and Pantis, J D (2011) Grazing effects on plant functional group diversity in Mediterranean shrublands. *Biodiversity and Conservation*, No 20, (12) pp2831-2843.

Paracchini, M L, Petersen, J-E, Hoogeveen, Y, Bamps, C, Burfield, I and van Swaay, C (2008) *High Nature Value Farmland in Europe - An Estimate of the Distribution Patterns on the Basis of Land Cover and Biodiversity Data*. JCR Scientific and Technical Reports EUR 23480 EN, Office for Official Publications of the European Union, Luxembourg.

Pardini, A and Nori, M (2011) Agro-silvo-pastoral systems in Italy: integration and diversification. *Pastoralism: Research, Policy and Practice*, No 1, (1) 26.

Pitts, E, O'Grady, S and Wimmer, H (2010) *The implementation of the "Health Check" of the CAP in the Member States, in particular with regard to the new articles 68 and 69 of Regulation (EC) n° 73/2009*. DG for Internal Policies, Directorate B: Structural and Cohesion Policy. Report for the European Parliament's Committee on Agriculture and Rural Development, European Parliament, Bruxelles.

Poláková, J, Tucker, G, Hart, K, Dwyer, J and Rayment, M (2011) *Addressing biodiversity and habitat preservation through Measures applied under the Common Agricultural Policy*. Report Prepared for DG Agriculture and Rural Development, Contract No. 30-CE-0388497/00-44, Institute for European Environmental Policy, London.

Rauschmayer, F, van den Hove, S and Koetz, T (2009) Participation in EU biodiversity governance: how far beyond rhetoric? *Environment and Planning C: Government and Policy*, No 27, (1) pp42-58.

Redman, M (2010) *Securing Public Benefits from Subsistence Agriculture in Romania: Assessing the Impact of Rural Development Policies*. Centre for Ecological Engineering, Tartu, Estonia.

Reed, M S, Bonn, A, Slee, W, Beharry-Borg, N, Birch, J, Brown, I, Burt, T P, Chapman, D, Chapman, P J, Clay, G D, Cornell, S J, Fraser, E D G, Glass, J H, Holden, J, Hodgson, J A, Hubacek, K, Irvine, B, Jin, N, Kirkby, M J, Kunin, W E, Moore, O, Moseley, D, Prell, C, Price, M F, Quinn, C H, Redpath, S, Reid, C, Stagl, S, Stringer, L C, Termansen, M, Thorp, S, Towers, W and Worrall, F (2009) The future of the uplands. *Land Use Policy*, No 26, (Supplement 1) S204-S216.

Republic of Slovenia Ministry of the Environment and Spatial Planning (2007) *Natura 2000 Site Management Programme 2007-2013. Operational Programme*. Republic of Slovenia - Ministry of the Environment and Spatial Planning, Ljubljana.

Riccheri, M (2006) *Report for Case Study "Arroz de Valencia"*. Universidad de Alicante, Alicante.

Rochon, J J, Duval, M and Goby, J P (2009) Effects on the environment of a flock of sheep when free ranging or under the guidance of a shepherd. *Options Méditerranéennes Series A*, No A85,

RSPB and Birdlife International (2011) *Seeds of Success: How agri-environment can yield results for nature and farming*. BirdLife International, Cambridge, UK.

Sánchez-Barbudo, I, Camarero, P R and Mateo, R (2012) Primary and secondary poisoning by anticoagulant rodenticides of non-target animals in Spain. *Science of the Total Environment*, No 420, pp280-288.

Šeffler, J, Rastislav, L, Galvánek, D and Stanová, V (2002) Grasslands of Slovakia. Final report on National Grassland Inventory 1998 – 2002. DAPHNE – Institute of applied Ecology, Bratislava.

Šefflerová, S V, Janák, M and Ripka, J (2008a) *Management of Natura 2000 Habitats: 1530 \*Pannonic salt steppes and salt marshes*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 03/24, European Commission, Brussels.

Šefflerová, S V, Šeffler, J and Janák, M (2008b) *Management of Natura 2000 Habitats: 7230 Alkaline fens*. Technical Report 2008 20/24, European Commission, Brussels.

SEO and Birdlife International (2011) *A New Management Model for SPAs: La Serena and its foothills (2001-2004). Alternative agricultural management compatible with environmental protection*. LIFE00NAT/E/7327, Sociedad Española de Ornitología / BirdLife International, Madrid.

Smith, H, Dänhardt, J, Lindström, Å and Rundlöf, M (2010) Consequences of organic farming and landscape heterogeneity for species richness and abundance of farmland birds. *Oecologia*, No 162, (4) pp1071-1079.

Stoate, C, Báldi, A, Beja, P, Boatman, N D, Herzog, I, van Doorn, A, de Snoo, G R, Rakosy, L and Ramwell, C (2009) Ecological impacts of early 21st century agricultural change in Europe – A review. *Environmental Management*, No 91, (1) pp22-46.

TEEB (ed) (2011) *The Economics of Ecosystems and Biodiversity in National and International Policy Making*. Edited by Patrick Ten Brink. Earthscan, London and Washington.

Temple, H J and Cox, N A (2009) *European Red List of Reptiles*. Office for Official Publications of the European Communities, Luxembourg.

UK NEA (2011) Chapter 5 Mountains, Moorlands and Heaths, in *The UK National Ecosystem Assessment Technical Report*, UNEP-WCMC, Cambridge.

Van Swaay, C.A.M., Van Strien, A.J., Harpke, A., Fontaine, B., Stefanescu, C., Roy, D., Maes, D., Kühn, E., Öunap, E., Regan, E., Švitra, G., Heliölä, J., Settele, J., Warren, M.S., Plattner, M., Kuussaari, M., Cornish, N., Garcia Pereira, P., Leopold, P., Feldmann, R., Jullard, R., Verovnik, R., Popov, S., Brereton, T., Gmelig Meyling, A., Collins, S. (2010). The European Butterfly

Indicator for Grassland species 1990-2009. Report VS2010.010, De Vlinderstichting, Wageningen.

Vassilev, K, Pedashenko, H, Nikolov, S C, Apostolova, I and Dengler, J (2011) Effect of land abandonment on the vegetation of upland semi-natural grasslands in the Western Balkan Mts., Bulgaria. *Plant Biosystems*, No 145, (3) pp654-665.

Verhulst, J, Kleijn, D and Berendse, F (2007) Direct and indirect effects of the most widely implemented Dutch agri-environment schemes on breeding waders. *Journal of Applied Ecology*, No 44, (1) pp70-80.

Vickery, J A, Tallowin, J R, Feber, R E, Asteraki, E J, Atkinson, P W, Fuller, R J and Brown, V K (2001) The management of lowland neutral grasslands in Britain: effects of agricultural practices on birds and their food resources. *Journal of Applied Ecology*, No 38, (3) pp647-664.

Whittingham, M J (2007) Will agri-environment schemes deliver substantial biodiversity gain, and if not why not? *Journal of Applied Ecology*, No 44, pp1-5.

Worrall, F, Evans, M G, Bonn, A, Reed, M S, Chapman, D and Holden, J (2009) Can carbon offsetting pay for upland ecological restoration? *Science of the Total Environment*, No 408, (1) pp26-36.

WWF and IEEP (2009) *Innovative use of EU funds to finance management measures and activities in Natura 2000 sites*. Output of the project Financing Natura 2000: Cost estimate and benefits of Natura 2000. Final report. Output of the EC project Contract No. 070307/2007/484403/MAR/B2, WWF, Brussels, Belgium.

Zechmeister, H G, Schmitzberger, I, Steurer, B, Peterseil, J and Wrabka, T (2003) The influence of land-use practices and economics on plant species richness in meadows. *Biological Conservation*, No 114, (2) pp165-177.

Zemekis, R, Krisciukaitiene, I, Kuliesis, G and Galnaityte, A (2007) *Review of payment calculations in animal welfare measures (215)*. SIXTH FRAMEWORK PROGRAMME SPECIFIC TARGETED RESEARCH PROJECT n° SSPE-CT-2006-044403.

Zimmermann, P, Tasser, E, Leitinger, G and Tappeiner, U (2010) Effects of land-use and land-cover pattern on landscape-scale biodiversity in the European Alps. *Agriculture, Ecosystems and Environment*, No 139, (1-2) pp13-2.

## ANNEXES

ANNEX A - Key habitat types of Community interest that are dependent on agricultural management

ANNEX B - Key species of Community interest associated with farmland

ANNEX C - Main habitats of Community interest dependent on agriculture in each Member State

ANNEX D - Management recommendations for each Annex I habitat type dependent on agricultural management

## Annex A Key habitat types of Community interest that are dependent on agricultural management

This table describes the key Annex I habitat types that are dependent on agriculture and the degree of dependency for each, as well as their distribution, total extent, proportion of habitat within Natura 2000 designated sites, and current conservation status.

### Key / Sources:

**Agri dep** = dependency on agriculture from Halada et al (2011): f = Fully dependent on agricultural management, p = Partially dependent because management either prolongs the existence of the habitat by blocking succession, or enlarges/maintains an enlarged area of habitat distribution, p/n = Partially dependent only for some sub-types or over part of the distribution, or doubts remain concerning their dependence on agricultural management. Where Halada et al (2011) and Sipkova et al (2010) disagree, the Sipkova et al (2010) ranking is indicated in brackets.

NB dunes with woody scrub (2160 dunes with *Hippophae rhamnoides* and 2170 dunes with *Salix repens* ssp. *argentea* (Salicion *arenariae*) are not included, although they are usually dependent on periodic scrub clearance to prevent succession. Also not included although sometimes dependent on management: 7150 Depressions on peat substrates of the Rhynchosporion (habitat occurs in small patches within larger habitat mosaic and only requires occasional management); 7140 Transition mires and quaking bogs (require low intensity grazing if drained). Two grassland habitat types found only in Bulgaria, Romania and Greece are not included because of lack of information (62C0, 62D0).

**Total extent** sourced from Article 17 report database (ETC/BD, 2008). \*NB the total extent and proportion of habitat does NOT include Romania (RO) and Bulgaria (BG). Presence of habitat in Romania and Bulgaria follows ETC/BD Habitat check list. **Proportion of habitat that is protected within SACs** is listed in Appendix to Coverage of habitats and species by the Natura 2000 network in the Article 17 report (ETC/BD, 2008).

**% UFC & % XX/XU**: The proportion of habitat area with unfavourable conservation status was calculated by totalling the sum of each habitat assessment per Member State and biogeographical region that was classified as being in overall unfavourable conservation status, and then dividing this by the total habitat area reported (ETC/BD 2008 Article 17 database). The proportion of habitat area with unknown conservation status was calculated in the same way (XU = unknown but very likely to be unfavourable). (NB: this assumes that all of the area within an unfavourably assessed habitat is in unfavourable status, whereas in the Article 17 reporting guidelines a certain proportion can still be in favourable status when the overall status is judged to be unfavourable).

### References:

- EC (2007) *Interpretation Manual of European Union Habitats - EUR27*. Natura 2000. European Commission, Brussels.
- EEA (2011) EUNIS Biodiversity Database. European Environment Agency <http://eunis.eea.europa.eu/index.jsp>
- EEA (2008) Habitats Directive Article 17 database. <http://www.eea.europa.eu/data-and-maps/data/article-17-database-habitats-directive-92-43-eec>
- ETC/BD (2008) Habitats Directive Article 17 Technical Report (2001-2006). European Topic Centre on Biological Diversity <http://bd.eionet.europa.eu/article17>
- ETC/BD (2012) Habitats check list. [http://bd.eionet.europa.eu/article17/reference\\_portal](http://bd.eionet.europa.eu/article17/reference_portal)
- Halada, L, Evans, D, Romão, C and Petersen, J-E (2011) Which habitats of European importance depend on agricultural practices? *Biodiversity and Conservation*, No 20, (11) pp2365-2378.
- Sipkova, Z., Balzer, S., Evans, D. & Ssyanek, A. (2010) Assessing the conservation status of European Union habitats - results of the Community report with a case study of the German National Report. *Annali di Botanica*. <http://laboratoriocritico.uniroma1.it/index.php/Annalidibotanica/article/view/9103>

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
<b>COASTAL AND HALOPHYTIC HABITATS</b>					
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	Atlantic salt meadows or salt marshes develop when halophytic vegetation colonises soft intertidal sediments of mud and sand in areas protected from strong wave action. This vegetation forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. The balance between erosion and accretion, which can be very local, plays a specific role in defining the extent of the habitat, and saltmarsh can cover large areas if it is not enclosed on the landward side. Salt meadows are characterized by salt tolerant vascular species, mostly in successional zones of differentiating salt tolerance with frequency and duration of tidal inundation. This habitat type is highly variable hosting a large plant and animal diversity occurring in different successional phases, ranging between pioneer marshes to habitat containing tree species on the upper tidal limits. Some salt marshes are historically ungrazed, but in historically grazed (and mown) areas continued grazing is significant in determining the structure and species composition of the habitat type and in determining its relative value for plants, for invertebrates and for wintering or breeding water birds. Characterised by <i>Aster tripolium</i> , <i>Puccinellia</i> spp., <i>Armeria maritima</i> , <i>Glaux maritima</i> , <i>Plantago maritima</i> , <i>Atriplex</i> spp., <i>Halimione</i> spp., <i>Artemisia maritima</i> . Habitat of <i>Bufo calamita</i> and <i>Bufo viridis</i> and breeding site for Annex I bird species. <b>Distribution:</b> found along the Atlantic, English Channel, North Sea, and Baltic shores.	p/n	1005 km <sup>2</sup> <b>SAC:</b> 76-100%	<b>UFC:</b> 100% <b>XX:</b> 0%
1340	Inland salt meadows* (priority habitat)	This rare inland habitat occurs where saline groundwater comes to the surface and the vegetation is formed by salt tolerant plants. Made up of different habitat types consisting of zones of seepage of saline water, running or stagnant saline water, with typical halophilous vegetation and of reed beds at the edge of brackish waters. Artificial or partly artificial sites are only included in specific cases where they harbour a species listed in Annex II of the Directive, or where there are no remaining natural (primary) examples of the habitat at regional or national level. Typical plants include <i>Atriplex hastata</i> , <i>Puccinellia distans</i> , <i>Juncus gerardii</i> , <i>Spergularia</i> spp., <i>Salicornia</i> spp. <b>Distribution:</b> mainly Continental; a few sites in the Alpine, Atlantic and Pannonic regions.	p	28 km <sup>2</sup> (+BG) <b>SAC:</b> 51%	<b>UFC:</b> 100% <b>XX:</b> 0%
1530	Pannonic salt steppes and salt marshes (priority habitat)	Salt steppes result from hot, dry summers with high evaporation of groundwater which brings salt to the soil surface. Salt marshes form around highly alkaline lakes. There is a characteristic zonation of vegetation, resulting from the fluctuation in water level, with dominant salt-tolerant or salt-dependent xerophytic rushes and grasses ( <i>Juncus gerardii</i> , <i>Festuca pseudovina</i> ), and succulent herbs. Salt lakes and alkali marshes are important resting and roosting sites for many migratory birds, and host some typically coastal and wetland species, as well as large numbers of Great Bustard ( <i>Otis tarda</i> ). Primary alkali <i>Artemisia</i> steppes are not dependent on management, but most habitats are <i>Achillea</i> steppes	p/n	2,015 km <sup>2</sup> (+BG&RO) <b>SAC:</b> 55%	<b>UFC:</b> 100% <b>XX:</b> 0%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
		created by hydrological modification of wetlands, or drained primary steppes or meadows, that have traditionally been extensively grazed with locally adapted breeds of cattle and sheep. <b>Distribution:</b> typical of Pannonic region in Hungary; relatively small areas in Austria, Bulgaria and Romania (Continental and Black Sea and Steppic regions).			
1630	Boreal Baltic coastal meadows ( <i>priority habitat</i> )	Coastal meadows influenced by flooding by the brackish water of the Baltic Sea. The species rich vegetation of halophytic plants mostly occurs in zones, with species tolerant of sea water closest to the sea. Long history of traditional management by grazing and mowing but now often abandoned. <i>Epidalea (Bufo) calamita</i> (natterjack toad) is a typical species. Salt marshes and coastal meadows are key habitats for several Annex I listed bird species as stopping off and overwintering sites and as breeding sites. The habitat has a number of stable states, and appropriate management will depend on conservation aims and management history. Where grazing rates have historically been high, the short sward can favour wading birds. <b>Distribution:</b> Widespread along the shores of the Baltic in Boreal and Continental regions.	p	229 km <sup>2</sup> SAC: 71%	<b>UFC:</b> 100% <b>XX:</b> 0%
<b>COASTAL SAND DUNES AND INLAND DUNES</b>					
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes) ( <i>priority habitat</i> )	'Grey' dunes form the immobile, grassy part of a dune system behind the mobile dunes, forming part of the dynamic assemblage of dune habitats. High quality habitat has a fine grained mosaic of open sand, moss, lichen and low grass cover, often partly maintained by rabbit grazing. Grey dunes are part of the mosaic of habitats in dune systems and blend into decalcified dunes (2140), dune heaths (2150) and Mediterranean dune grasslands and juniper scrub (2210, 2220, 2230, 2240 and 2250), and merge with dune slacks (2170 and 2190). Management varies from 'stabilised' dunes that require continuous grazing, to more dynamic dunes influenced by sand drift, although long-term conservation will usually depend on maintenance of the dynamics of the whole dune system. The threats to the habitat come from over-stabilisation through techniques to prevent sand-drift, a lack of appropriate grazing levels, growth of native and non-native (introduced) scrub, afforestation and invasive alien species. Nutrient levels need to be kept low, and the most significant concern across the range of sites is the impact of atmospheric nutrient deposition on the more acid sites. <b>Distribution:</b> Atlantic, Macaronesian, Baltic and Black Sea coasts (and Steppic). In the Mediterranean basin, habitat 2250 occupies a similar position in the dune complex (although Italy has reported this habitat from the Adriatic).	p/n	855 km <sup>2</sup> (+BG&RO) SAC: 57%	<b>UFC:</b> 95% <b>XX:</b> 1%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
2140	Decalcified fixed dunes with <i>Empetrum nigrum</i> (priority habitat)	Dunes with crowberry ( <i>Empetrum nigrum</i> ) form the most inland part of the dune complex in Northern Europe (see 2130 above). Characterised by a thin black humus layer on top of the sand. Most habitats were developed under a long history of grazing by livestock. Some subtypes are not dependent on management. <b>Distribution:</b> coasts of Atlantic and Baltic in northern Europe (Atlantic, Boreal, Continental).	p/n	228 km <sup>2</sup> SAC: 58%	<b>UFC:</b> 93% <b>XX:</b> 0%
2150	Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> ) (priority habitat)	Dune heaths with heathers ( <i>Calluna vulgaris</i> , <i>Erica</i> spp) and gorse ( <i>Ulex</i> spp), often with sand sedge ( <i>Carex arenaria</i> ). They form the most inland part of the dune complex in Southern Europe. Usually grazed together with dune scrub habitats. Some subtypes are not dependent on management. <b>Distribution:</b> Atlantic coasts from Portugal north to Germany and the British Isles (a few sites in bordering Continental and Mediterranean regions).	p/n	56 km <sup>2</sup> SAC: 41%	<b>UFC:</b> 28% <b>XX:</b> 72%
2190	Humid dune slacks	Humid dune slacks occur where the water table reaches the surface, forming flat valley wetlands in a dune complex including open water, fens and wet grasslands (see 2130 above). Slacks are rich with species that can survive the anaerobic conditions and fluctuating salinity. Primary dune slacks run parallel to a dune coastline and are formed when a developing sand ridge cuts off a portion of beach. Secondary dune slacks are formed by the landward movement of dune ridges over stable wet sand at the water table, leaving dips scoured out by wind. Sensitive to changes in water regime, and dependent for their continued long-term existence on regular disturbance through the dynamic action of tides, groundwater and sand blow-outs influencing the dune system. Management by mowing or grazing slows succession. Grazed by rabbits. <b>Distribution:</b> along coastlines throughout the European Union (Atlantic, Boreal, Continental, Black Sea and Steppic) although relatively rare in the Mediterranean.	p	200 km <sup>2</sup> (+BG&RO) SAC: 51%	<b>UFC:</b> 93% <b>XX:</b> 6%
21A0	Machairs (priority habitat)	Machairs are cultural landscapes on windblown calcareous sand developed by centuries of low intensity grazing and cultivation. Traditional management (crofting) as winter grazing on the unfenced commonage, with summer grazing on surrounding uplands. Traditional rotational arable farming with stoking of hay, use of seaweed fertilizer and fallow. The habitat mosaic has traditionally maintained a high density and diversity of wild arable weeds, which in turn supports a wide range of birds and invertebrates. <b>Distribution:</b> Atlantic (western Ireland and Scotland).	f	28 km <sup>2</sup> SAC: 27%	<b>UFC:</b> 100% <b>XX:</b> 0%
2250	Coastal dunes with <i>Juniperus</i> spp. (priority habitat)	Coastal dunes with various species of juniper ( <i>Juniperus</i> spp) shaped by the wind. Associated with dune scrubs of <i>Corema album</i> in the Mediterranean. The habitat forms the succession to embryonic shifting dunes and white dunes, and is therefore dependent on a dynamic dune system for its long-term survival as the habitat tends towards climax woodland. Where habitat status is good and not under any	p	183 km <sup>2</sup> SAC: 67%	<b>UFC:</b> 76% <b>XX:</b> 24%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
		threat, the habitat does not require any management. However many sites require eradication of invasive plants, fire prevention, shrub clearance and controlled grazing. <b>Distribution:</b> around Atlantic coasts of the Iberian Peninsula and the Mediterranean and more locally around Denmark and the UK (Atlantic & Continental).			
2310	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>	Inland dunes with heather ( <i>Calluna vulgaris</i> ) and species of <i>Genista</i> formed from sand that originated from glacial drift and outwash. The large dune systems still contain many specialised and localised species, but they have regressed considerably and the remaining examples are fragile and often threatened. The habitat types 2310, 2320, 2330 (inland dune grasslands) and 4030 (European dry heaths) may occur within the same area. Dry sandy heaths are often considered to be part of habitat 4030 European dry heaths but they differ in their geological history and characteristic vegetation. <b>Distribution:</b> on the plains of northern Europe in Atlantic and Continental regions (Belgium, Germany, Denmark and Netherlands).	p/n (or f)	174 km <sup>2</sup>  SAC: 68%	<b>UFC:</b> 100% <b>XX:</b> 0%
2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	Heaths on sandy soils that originated from glacial drift and outwash (NOT dunes - which differentiates it from habitat 2140). The heaths tend to occur in more humid locations than habitat 2310. With heather ( <i>Calluna vulgaris</i> ) and crowberry ( <i>Empetrum nigrum</i> ), and characteristic mosses and lichens in open patches. Dry sandy heaths are often considered to be part of habitat 4030 European dry heaths but they differ in their geological history and characteristic vegetation. <b>Distribution:</b> on the coastal plains of northern Europe in Atlantic, Boreal and Continental regions.	p/n (or f)	47 km <sup>2</sup>  SAC: 43%	<b>UFC:</b> 99% <b>XX:</b> 1%
2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	Open sparsely vegetated acidic grasslands on inland dunes formed by wind action. Often species poor but with many annual plants (eg <i>Spergula morisonii</i> ), grasses ( <i>Agrostis</i> spp. and <i>Corynephorus canescens</i> ), and carpets of fruticose lichens. <b>Distribution:</b> mainly plains of northern Europe (Atlantic, Boreal) but also reported from some parts of the Mediterranean (Romania) and from the Pannonian region (eg Czech Republic).	p/n (or f)	319 km <sup>2</sup> (+RO)  SAC: 43%	<b>UFC:</b> 98% <b>XX:</b> 2%
2340	Pannonic inland dunes (priority habitat)	Mosaic of different inland dune habitats - open sand, dune lichen communities ( <i>Cladonia</i> spp.), pioneer swards with many therophytes ( <i>Thymus serpyllum</i> ), open and closed swards. (NB Steppe grassland on stabilised sand or sandy soils NOT associated with dune complexes is part of habitat 6260). Formerly widely distributed as a result of hay harvesting and grazing. <b>Distribution:</b> Pannonic plain and small areas in bordering Continental and Mediterranean (Austria, Bulgaria, Hungary, Romania, Slovakia).	f	12 km <sup>2</sup> (+BG& RO)  SAC: 29%	<b>UFC:</b> 100% <b>XX:</b> 0%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
<b>TEMPERATE HEATH AND SCRUB</b>					
4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	Wet heath usually occurs on acidic, nutrient-poor substrates, such as shallow peats or sandy soils with impeded drainage and relatively high rainfall. The vegetation is typically dominated by mixtures of <i>Erica tetralix</i> , <i>Calluna vulgaris</i> , grasses, sedges and <i>Sphagnum</i> bog-mosses. It is often found as a transitional community between dry heath and blanket mire within complex habitat mosaics. The degree of waterlogging is crucial in the formation and maintenance of this community. Although some wet heath is a naturally occurring community, most is secondary habitat in which increasing human influence over the last 6000 years, in the form of grazing, burning and cutting, has removed the woodland component of the heathland mosaic and led to the development of the now characteristic open habitat of the modern era. Large areas have been lost to afforestation and agricultural intensification. <b>Distribution:</b> Atlantic fringe of Europe from Norway to France (Normandy). A high proportion of the EU resource occurs in the UK and Ireland.	f (or p/n)	4,846 km <sup>2</sup> SAC: 41%	<b>UFC:</b> 100% <b>XX:</b> 0%
4020	Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i> (priority habitat)	Wet heaths with Dorset heath ( <i>Erica ciliaris</i> ) are a priority form of Northern Atlantic wet heaths with <i>Erica tetralix</i> . <b>Distribution:</b> mostly along the Atlantic coast from Portugal to south-western England but also in the Pyrenees (Alpine & Continental) and Mediterranean parts of Spain and France.	f	1,528 km <sup>2</sup> SAC: 41%	<b>UFC:</b> 16% <b>XX:</b> 84%
4030	European dry heaths	European dry heaths typically occur on freely-draining, acidic to circumneutral (siliceous, podsolic) soils with generally low nutrient content in moist Atlantic and sub-Atlantic climates. Ericaceous dwarf-shrubs dominate the vegetation. The most common is <i>Calluna vulgaris</i> , which often occurs in combination with <i>Ulex</i> spp., <i>Vaccinium</i> spp. or <i>Erica cinerea</i> , though other dwarf-shrubs are important locally. Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock and/or, in upland areas, for deer or as grouse moors. NB dry heath vegetation that has developed on deep peat as a result of drainage is regarded as degraded bog. <b>Distribution:</b> plains and low mountains of Western, Central and Northern Europe, especially in Spain, Ireland and the UK (found in most biogeographic regions).	f	28,823 km <sup>2</sup> SAC: 13-68%	<b>UFC:</b> 52% <b>XX:</b> 47%
4040	Dry Atlantic coastal heaths with <i>Erica vagans</i> (priority habitat)	Dry heaths with Cornish heath ( <i>Erica vagans</i> ). <b>Distribution:</b> along the Atlantic coast of northern Spain and rarely in western France and south west England.	f	16 km <sup>2</sup> SAC: 33%	<b>UFC:</b> 63% <b>XX:</b> 0%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
4060	Alpine and Boreal heaths	Heaths of the sub-alpine and alpine zones; includes a wide range of variation linked to soil type and geography with 11 subtypes. Traditionally grazed in summer in south and central Europe, based on traditional 'transhumance' regime. Where the habitat occurs at lower altitudes, and in more northerly regions including UK, grazing is year round. In the Boreal region the habitat is usually grazed by reindeer. Some subtypes are not dependent on management. <b>Distribution:</b> subtypes typical of Alpine and Boreal regions. Subtypes also occur on mountains in other regions.	p/n	33,719 km <sup>2</sup> (+BG&RO) SAC: 73%	<b>UFC:</b> 22% <b>XX:</b> 4%
4090	Endemic oro-Mediterranean heaths with gorse	Dry heaths with low, cushion-forming, often spiny shrubs, such as <i>Acantholimon</i> , <i>Astragalus</i> , <i>Erinacea</i> , <i>Vella</i> , <i>Bupleurum</i> , <i>Ptilotrichum</i> , <i>Genista</i> , <i>Echinospartum</i> , <i>Anthyllis</i> and various composites and labiates. There is much variation and fifteen subtypes are defined, so conservation recommendations vary. Habitat of the Annex IV invertebrate <i>Baetica ustulata</i> . <b>Distribution:</b> typical of high mountains in Mediterranean and Macaronesian regions (Canary Islands, Azores and Madeira – Spain and Portugal) and adjacent areas (Atlantic, Continental).	p	23,592 km <sup>2</sup> (+BG) SAC: 62%	<b>UFC:</b> 2% <b>XX:</b> 91%
<b>SCLEROPHYLLOUS SCRUB (MATORRAL)</b>					
5120	Mountain <i>Cytisus purgans</i> formations	Scrub dominated by Provence broom ( <i>Cytisus purgans</i> , also known as <i>Genista purgans</i> and sometimes divided into four species), often in association with habitat types 4060 and 4090. Some subtypes are not dependent on management. <b>Distribution:</b> higher mountains of southwest Europe (over 80% in Mediterranean) but also occurs in the Pyrenees (Alpine) and Continental regions.	p/n	3,409 km <sup>2</sup> SAC: 73%	<b>UFC:</b> 0% <b>XX:</b> 92%
5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	Juniper ( <i>Juniperus communis</i> ) scrub often in association with grasslands (such as 6210) or heaths (eg 4030). Succession community to calcareous grassland (6210) or <i>Calluna</i> heath so expansion may be at the expense of these Annex 1 habitats. <b>Distribution:</b> widespread across much of central and western Europe in all biogeographic regions except Macaronesian. In the Mediterranean region juniper scrub is defined as habitat type 5210.	p	1,440 km <sup>2</sup> (+BG&RO) SAC: 30%	<b>UFC:</b> 47% <b>XX:</b> 7%
5210	Arborescent matorral with <i>Juniperus</i> spp.	Matorral (evergreen scrub) with juniper trees such as <i>Juniperus oxycedrus</i> , <i>Juniperus phoenicea</i> and <i>Juniperus thurifera</i> . Primary matorral does not require active management. <b>Distribution:</b> widespread around Mediterranean and Black Sea basins, and adjacent parts of Alpine, Atlantic & Continental regions.	p/n	9,867 km <sup>2</sup> (+BG) SAC: 65%	<b>UFC:</b> 0% <b>XX:</b> 86%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
5330	Thermo-Mediterranean and pre-desert scrub	This habitat type includes a wide variety of scrub formations for the most part indifferent to the siliceous or calcareous nature of the substrate, characteristic of the thermo-Mediterranean zone. Habitat covers a wide area and is very variable in composition and structure. There are 3 main subtypes which require different management. Some subtypes are not dependent on management. <b>Distribution:</b> hotter, more arid parts of Mediterranean and Macaronesian regions (Canary Islands), together with an adjacent part of the Continental region in Italy.	p/n	12,154 km <sup>2</sup> SAC: 69%	<b>UFC:</b> 15% <b>XX:</b> 77%
5420	<i>Sarcopoterium spinosum</i> phrygas	Low, thorny cushion forming shrubs, often summer deciduous, characterised by <i>Sarcopoterium spinosum</i> . Maintained by extensive grazing by goats and sheep. <b>Distribution:</b> coast and islands of eastern Mediterranean from Malta to Greece and Cyprus. This habitat is much more widespread and diverse than habitat type 5410 clifftop phrygas from the western Mediterranean (extremely local and isolated habitats, not considered dependent on agricultural activity).	p	2,520 km <sup>2</sup> SAC: 85%	<b>UFC:</b> 0% <b>XX:</b> 6%
5430	Endemic phrygas of the Euphorbio-Verbascion	Low, thorny cushion forming shrubs, often summer deciduous. A number of different subtypes with much regional variation in species composition and dominant species (eg <i>Euphorbia</i> , <i>Hypericum</i> , <i>Genista</i> , <i>Helichrysum</i> , <i>Launaea</i> ). Maintained by extensive grazing by goats and sheep. <b>Distribution:</b> locally, but widely, distributed on islands in the Mediterranean from the Balearic Islands (Spain) to Crete (Greece) with a few sites on the mainland coast in Greece and Italy.	p	451 km <sup>2</sup> SAC: 79%	<b>UFC:</b> 0% <b>XX:</b> 7%
<b>NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS</b>					
6110	Rupicolous calcareous or basophilic grasslands of the Alyso-Sedion albi ( <i>priority habitat</i> )	Open xerothermophile pioneer grasslands with many annual and succulent plants such as stonecrops ( <i>Sedum</i> spp.) growing on skeletal base-rich or calcareous soils. Usually this habitat occurs in small patches and estimates of area are difficult. Some subtypes not dependent on management. <b>Distribution:</b> Most widespread in central Europe (Continental, Pannonian, Alpine) but also occurs in Boreal, Atlantic, Mediterranean and Black Sea regions.	p/n	1,434 km <sup>2</sup> (+BG&RO) SAC: 57%	<b>UFC:</b> 12% <b>XX:</b> 78%
6120	Xeric sand calcareous grasslands ( <i>priority habitat</i> )	Dry open grasslands on well-drained, calcareous sandy soils, sometimes associated with inland dune systems. Remaining areas are very small and so reliant on management of the wider landscape. Habitat of the endemic Annex II plant <i>Dianthus arenarius</i> ssp. <i>arenarius</i> in Scania, southern Sweden. <b>Distribution:</b> typical of plains of northern Europe from France to Latvia, including southern Sweden (Atlantic, Boreal, and parts of Continental, Mediterranean and Pannonic).	p	153 km <sup>2</sup> (+RO) SAC: 18%	<b>UFC:</b> 99% <b>XX:</b> 1%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
6140	Siliceous Pyrenean <i>Festuca eskia</i> grasslands	Subalpine and alpine grasslands on acidic, north facing slopes with the endemic grass <i>Festuca eskia</i> . Dependent on continuation of pastoral use; grazing and trampling are critical to maintaining the species and characteristics of the habitat and it can withstand relatively heavy sheep grazing. <b>Distribution:</b> Pyrenees and Cantabrian mountains in Spain and France (Alpine, Atlantic). Acidic alpine grasslands elsewhere in Europe are habitat type 6150.	p	921 km <sup>2</sup> SAC: 90%	<b>UFC:</b> 64% <b>XX:</b> 11%
6150	Siliceous alpine and boreal grasslands	Acidic grasslands of the higher summits of mountains in the Alps and Scandinavia with outliers elsewhere such as the Carpathians, with <i>Juncus trifidus</i> , <i>Carex bigelowii</i> , mosses and lichens. Also included are associated snowbed communities. <b>Distribution:</b> mountains in the Alps, Carpathians and Scandinavia together with higher mountains elsewhere in northern Europe such as in the north of the British Isles (Alpine, Atlantic, Boreal, Continental). Similar vegetation in the Pyrenees and northern Spain is habitat type 6140.	p	8,390 km <sup>2</sup> (+BG&RO ) SAC: 58%	<b>UFC:</b> 10% <b>XX:</b> 0%
6160	Oro-Iberian <i>Festuca indigesta</i> grasslands	Open grasslands of the upper slopes and summits of high mountains with the grass <i>Festuca indigesta</i> , often as stripes and garlands of vegetation together with gorse heaths (habitat 4090). Habitat of the Annex IV invertebrate spp <i>Baetica ustulata</i> and <i>Plebicula golgus</i> . Traditional extensive sheep grazing. <b>Distribution:</b> Iberian Peninsula (Atlantic / Mediterranean).	p	4,176 km <sup>2</sup> SAC: 68%	<b>UFC:</b> 0% <b>XX:</b> 100%
6170	Alpine and subalpine calcareous grasslands	Calcareous grasslands of the alpine and subalpine zones on base-rich soils. Harsh climatic conditions (i.e. low temperatures, prolonged frost, heavy snow accumulation) limit the vegetative period to a few months. Alpine calcareous grasslands are highly diverse, with abundant endemic and rare species, incl. Lepidoptera. Includes much regional variation and five subtypes have been defined, with many plant communities, mainly in the <i>Elyno-Seslerietea</i> and <i>Ononidetalia striatae</i> phytosociological classes. Typical species include <i>Dryas octopetala</i> , <i>Gentiana</i> spp., <i>Oxytropis</i> spp., <i>Kobresia</i> grass, <i>Carex rupestris</i> , <i>Festuca gautieri</i> . Many of these grassland communities are stable, but very sensitive to disturbances. When the vegetative cover is altered or there is significant loss of soil, it is almost impossible to restore the original habitat. Given the high structural complexity and fragility of the habitat, the best management practice is to leave it alone. <b>Distribution:</b> Alps, Pyrenees, Carpathians, Cantabrian & Scandinavian mountains; very locally in the Abruzzi and the Balkan peninsula mountains (Alpine, Atlantic, Continental, Mediterranean).	p	9,967 km <sup>2</sup> (+BG&RO ) SAC: 64%	<b>UFC:</b> 26% <b>XX:</b> 31%
6180	Macaronesian mesophile grasslands	Secondary grasslands of the highest hills typically with endemic grasses <i>Festuca jubata</i> and <i>Deschampsia foliosa</i> and with large herbaceous plants. Usually in small patches mixed with Macaronesian forest and scrub types (Macaronesian Laurel Forest 9360, Macaronesian Heaths 4050, Macaronesian Juniper Forests 9560). <b>Distribution:</b> Azores and Madeira in Macaronesian region (Portugal).	p	141 km <sup>2</sup> SAC: 86%	<b>UFC:</b> 100% <b>XX:</b> 0%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
6190	Rupicolous pannonic grasslands (Stipo-Festucetalia pallentis)	Open pioneer grasslands on shallow soils on rock or steep, well-drained slopes of limestone or dolomitic mountains. Hosts many Annex II and IV species such as <i>Dianthus plumarius</i> ssp. <i>regis-stephani</i> ( <i>Dianthus lumnitzeri</i> ). <b>Distribution:</b> Pannonian region and adjacent areas of the Alpine and Continental regions in Hungary, Slovakia and Czech Republic.	f	26 km <sup>2</sup> (+RO) SAC: 47%	<b>UFC:</b> 63% <b>XX:</b> 0%
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	Dry to semi-dry grasslands on chalk or limestone; where the habitat is orchid rich it is considered to be 'priority' habitat. Steppic or subcontinental ( <i>Festuca valesiaca</i> ) and more oceanic and sub-Mediterranean types ( <i>Bromus erectus</i> , <i>Festuca ovina</i> , <i>Brachypodium pinnatum</i> , <i>Sesleria albicans</i> ). Often in association with Juniper scrub (habitat 5130), Pannonic scrub (habitat 40A0), thermophile forests (eg habitats 91F0, 91H0). Requires low intensity or extensive management by grazing or mowing – grazing is usually preferable for invertebrates but management must be adapted to site history. Abandonment results in thermophile fringe vegetation ( <i>Trifolio-Geranietea</i> ) and then thermophile scrub. <b>Distribution:</b> typical of much of Europe, found in all biogeographical regions except Macaronesian and Steppic.	f (or p/n)	9,164 km <sup>2</sup> (+BG&RO) SAC: 49%	<b>UFC:</b> 49% <b>XX:</b> 23%
6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea ( <i>priority habitat</i> )	Includes a variety of xeric, thermophilic and mostly open Mediterranean perennial and annual grassland types, on nutrient poor but base-rich soils. Three major subtypes: perennial basophile rather hard short-grass communities, included in <i>Lygeo-Stipetalia</i> ; very dense and short but highly productive perennial summer drying swards, created by intense and continuous livestock activity, included in <i>Poetalia bulbosae</i> ; and pioneer and ephemeral basophilous annual grasslands, included in <i>Brachypodietalia (Trachynietalia) distachyae</i> . The diversity of plant, invertebrate and vertebrate communities is usually high. The habitat usually occurs in a mosaic pattern with a wide variety of related habitats, traditionally managed by extensive shepherded grazing. <b>Distribution:</b> typical of Mediterranean basin (99% of area), but also found on Black Sea, and in adjacent parts of Alpine, Atlantic and Continental regions.	f	14,702 km <sup>2</sup> (+BG) SAC: 60%	<b>UFC:</b> 3% <b>XX:</b> 82%
6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe) ( <i>priority habitat</i> )	This is one of the most widespread semi-natural grasslands, with distinct upland and lowland subtypes. It occurs on dry or mesophile oligotrophic soils on siliceous substrates (and more rarely on washed out calcareous soils) and is sensitive to eutrophication through high livestock loads, fertilisation, and airborne pollution. Hosts <i>Phengaris (Maculinea)</i> butterfly species, grasshoppers, and high-altitude bird communities. Whilst some types (eg alpine) can be considered as climax vegetation not requiring active management, the long-term existence of the habitat is closely associated with extensive pastoral traditions. A combination of mowing and grazing is traditional in many parts of Europe. The definition of this habitat has caused problems as several countries have large areas of species poor grassland	f	3,525 km <sup>2</sup> (+BG&RO) SAC: 37%	<b>UFC:</b> 80% <b>XX:</b> 2%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
		dominated by <i>Nardus stricta</i> as a result of long periods of overgrazing of little interest for nature conservation - such grasslands should not be included in this habitat. <b>Distribution:</b> widespread across much of the European Union in most biogeographic regions, with most in the Alpine region.			
6240	Sub-pannonic steppic grassland (priority habitat)	Steppe-like grasslands dominated by tussocky feather grasses such as <i>Stipa capillata</i> and <i>Stipa joannis</i> . These xerothermic communities are developed on southern exposed slopes with rocky and gravelly soils. They are partially of natural, partially of anthropogenic origin. <b>Distribution:</b> typical of central Europe where it is most widespread in Pannonic region in Bulgaria, Hungary, Czech Republic, Slovakia, Romania (some 75% of total area), but also occurs locally in French Alps (where the microclimate of the Durance valley gives similar conditions).	p (p/n )	275 km <sup>2</sup> (+BG& RO)  SAC: 67%	<b>UFC:</b> 100% <b>XX:</b> 0%
6250	Pannonic loess steppic grasslands (priority habitat)	Grasslands rich in perennial grasses on loess (windblown) deposits. Originally covered wide areas, now restricted to specific land forms like loess ridges formed by fluvial erosion and accumulation. Characterised by <i>Festuca rupicola</i> , <i>Astragalus</i> spp., <i>Crambe tatarica</i> , etc. <b>Distribution:</b> typical of Pannonian basin in Bulgaria, Hungary, Czech Republic, Slovakia (more than 95% of total area) but also occur in adjacent parts of Alpine and Continental regions (Austria).	f	207 km <sup>2</sup> (+BG& RO)  SAC: 39%	<b>UFC:</b> 99% <b>XX:</b> 1%
6260	Pannonic sand steppes (priority habitat)	Open grassy steppes created by wind erosion on base-rich sandy soils, dominated by tussock forming grasses such as <i>Festuca vaginata</i> , <i>Stipa borysthena</i> , <i>Stipa capilla</i> and <i>Stipa pulcherrima</i> , with many endemic steppe species. Grasslands occur in a mosaic with bare ground surfaces, and vegetation covers no more than 50–60% of the area, which dries out in mid or late summer. Closed sand steppe types with over 50% cover are typified by <i>Festuca wagneri</i> and <i>Festuca rupicola</i> . Most of the dune systems have been stabilized, and traditionally managed with low intensity extensive grazing of sheep, cattle or goats. However, in areas where natural dune dynamics remain, active management is not necessary. <b>Distribution:</b> Almost all of area in Pannonian region (Czech Republic, Hungary, Slovakia), plus an adjacent part of the Continental region in Austria and Black Sea and Steppic regions in Romania.	f	486 km <sup>2</sup> (+BG& RO)  SAC: 33%	<b>UFC:</b> 100% <b>XX:</b> 0%
6270	Fennoscandian lowland species-rich dry to mesic grasslands (priority habitat)	Neutral to acidic nutrient-poor grasslands on dry to semi-dry soils of the Fennoscandian lowlands resulting from grazing and/or mowing over many years leading to species-rich plant communities. Does not tolerate any fertilization. Species composition varies in different geographical areas, on different soils and moisture regimes and different management regimes. Typical species include <i>Arnica montana</i> , <i>Botrychium lunaria</i> , <i>Filipendula vulgaris</i> , <i>Leontodon hispidus</i> , and <i>Pulsatilla vulgaris</i> . Requires low intensity or extensive management by grazing or mowing – grazing is usually preferable for invertebrates but management must be adapted to site history. Abandonment results in succession to forest vegetation.	f	449 km <sup>2</sup>  SAC: 22%	<b>UFC:</b> 100% <b>XX:</b> 0%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
		<b>Distribution:</b> occurs in Boreal region (Sweden, Finland, Baltic countries) and the adjacent part of the Continental region in southern Sweden.			
6280	Nordic alvar and precambrian calcareous flatrocks (priority habitat)	Flat, calcareous rocks with sparse, patchy vegetation influenced by exposure to winds, causing dryness in summer, and the impact of frost and freezing in winter. The soils, where present, are a product of weathering and are very shallow. Specialist bryophyte and plant species, including <i>Androsace septentrionalis</i> , <i>Asperula tinctoria</i> , <i>Carlina vulgaris</i> , <i>Helianthemum oelandicum</i> , and the Annex II species <i>Sisymbrium supinum</i> , <i>Senecio jacobea ssp. gotlandica</i> , and <i>Artemisia oelandica</i> . Calcareous flatrocks mostly occur in a mosaic with related habitats, such as semi-natural dry grasslands (6210), rupicolous calcareous or basophilic grasslands (6110) and limestone pavements (8240), and a holistic management approach is advisable. Low density grazing by cattle, sheep or horses is a basic requisite to prevent scrub invasion. <b>Distribution:</b> very limited distribution in Boreal western Estonia and southern Sweden, primarily the islands of Gotland and Öland, with minor areas in southwest Finland.	f	349 km <sup>2</sup> SAC: 54%	<b>UFC:</b> 53% <b>XX:</b> 0%
62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	Dry grasslands similar to habitat type 6210 but with a greater number of plants typical of the Mediterranean basin including Annex II and IV plant species such as <i>Genista holopetala</i> and <i>Euphrasia marchesettii</i> . <b>Distribution:</b> Balkan peninsula in north-eastern Italy, Slovenia, Bulgaria and Greece (Mediterranean and bordering Alpine, Continental and Black Sea).	f	909 km <sup>2</sup> (+BG) SAC: 95%	<b>UFC:</b> 91% <b>XX:</b> 0%
6310	Dehesas with evergreen <i>Quercus</i> spp.	Dehesas are wood pastures or matorral forming a typical cultural landscape of the Iberian Peninsula with evergreen oaks such as cork oak ( <i>Quercus suber</i> ) growing as a fairly closed to very open canopy. Pigs and sheep are grazed under the trees. Oak mortality and lack of regeneration of trees is the biggest problem. Key habitat of raptors, crane ( <i>Grus grus</i> ), of large insects and their predators and of Iberian lynx ( <i>Lynx pardinus</i> ). <b>Distribution:</b> typical of Mediterranean Spain and Portugal (where this habitat is known as montado), also found locally in France and Italy.	f	15,674 km <sup>2</sup> SAC: 65%	<b>UFC:</b> 0% <b>XX:</b> 98%
6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	Meadows with purple moorgrass ( <i>Molinia caerulea</i> ) on wet, infertile soils resulting from long periods of traditional management such as late mowing. Species-poor <i>Molinia</i> meadows created as a result of draining peat bogs or fens are not included in this habitat. <b>Distribution:</b> widespread across central, northern and western Europe (Atlantic, Continental, Boreal). Occurs more rarely in the Mediterranean region, and in the Black Sea and Steppic regions in Romania.	f	1,535 km <sup>2</sup> (+BG& RO) SAC: 35%	<b>UFC:</b> 94% <b>XX:</b> 4%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
6420	Mediterranean tall humid herb grasslands of the <i>Molinio-Holoschoenion</i> )	Mediterranean humid grasslands formed by tall grasses and rushes, often associated with coastal dunes. Sensitive to changes in groundwater levels. Typical species include <i>Scirpus holoschoenus</i> , <i>Schoenus nigricans</i> , <i>Molinia caerulea</i> , <i>Cyperus longus</i> , <i>Lysimachia ephemerum</i> . <i>Microtus cabrerai</i> is characteristic mammal species. <b>Distribution:</b> throughout the Mediterranean basin, on the Canary Islands (Spain) (Macaronesian), and around the Black Sea (and Steppic region) in Bulgaria and Romania.	p	2,471 km <sup>2</sup> (+BG& RO) SAC: 65%	<b>UFC:</b> 3% <b>XX:</b> 95%
6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	The habitat includes two main subtypes. Subtype 1 includes wet and nitrophilous tall herb edge communities, along water courses and woodland borders belonging to the Glechometalia hederaceae and the Convolvuletalia sepium orders (Senecion fluviatilis, Aegopodion podagrariaeae, Convolvulion sepium, Filipendulion). Subtype 1 is often affected by yearly flooding and thereby obtains nutrients as well as silt and clay. The vegetation communities are very varied, eg France registers 12 variants within these two subtypes. Many of the species in the habitat are dispersed by stream water. Subtype 2 includes hydrophilous perennial tall herb communities of mountain to alpine levels of the Betulo-Adenostyletea class. The habitat occurs on humid, relatively nutrient-rich soils and is dependent on regular disturbance to prevent succession. Disturbance factors vary, including regular flooding, avalanches and landslides in mountainous areas, in some cases extensive mowing or grazing. In areas with cold climate, the presence of ice has a striking impact on the vegetation; plants, bushes, even trees may be torn away by melting ice and running water during spring flooding. In Scandinavia, the habitat has sometimes been maintained by mowing, and such meadows with long management continuity can have a species-rich composition dependent on recurring management. If abandoned, such areas normally turn into closed forest. Historically unmanaged habitats should not be grazed. <b>Distribution:</b> widespread in the Atlantic, Continental, Boreal and Alpine regions.	p/n	2334 km <sup>2</sup> (+BG& RO) SAC: 16-58%	<b>UFC:</b> 77% <b>XU:</b> 23%
6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	These alluvial meadows along large continental rivers result from a combination of regular (short) winter flooding and mowing for hay in summer when they dry out. This continental summer dryness differentiates them from <i>Calthion palustris</i> meadows, and the mineral soil with a good supply of nutrients from flooding differentiates them from <i>Molinion</i> meadows (6410). This is a transition habitat between wet and dry meadows and covers small areas. Meadows were traditionally mown once or twice a year, depending on weather and floods, and only grazed lightly once the soils have dried out, or after hay cutting. Vegetation is strongly affected by flood regime (timing and longevity), and habitat is divided into 1) wet <i>Cnidion</i> meadows with high groundwater table even in summer, 2) summer dry continental <i>Cnidion</i> meadows, regularly briefly flooded in spring but dry in summer and mown, with typical continental species, 3) suboceanic <i>Cnidion</i> meadows, only briefly or not flooded but do not dry	f	639 km <sup>2</sup> (+BG& RO) SAC: 52%	<b>UFC:</b> 100% <b>XX:</b> 0%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
		out in summer, 4) mesophytic, continental <i>Cnidion</i> meadows in higher locations with vegetation transitional to hay meadows, mown once a year. The area of this habitat has been greatly reduced by river regulation and intensification. Large-scale restoration of natural floodplain dynamics has a strong positive effect on habitat status. <b>Distribution:</b> typical of central Continental Europe (Hungary, Poland, Slovakia, Czech Republic, Germany, Austria), also in Atlantic (Rhine), Pannonic, and Black Sea & Steppic regions (Romania).			
6450	Northern Boreal alluvial meadows	Meadows on flood sediments along rivers which freeze in winter and flood in spring - following the spring thaw. The species composition varies depending on the water regime, most characteristic are <i>Calamagrostis</i> spp., <i>Carex</i> spp., <i>Deschampsia cespitosa</i> , or <i>Phalaris arundinacea</i> . Typical species also include <i>Bartsia alpina</i> , <i>Carex heleonastes</i> , <i>Equisetum fluviatile</i> , <i>Pedicularis palustris</i> , and <i>Succisa pratensis</i> . The habitat may be kept open by the disturbance effects of floods, ice etc, but traditionally these have also often been managed as productive hay meadows, scythed by hand. This management increased the areas of open meadows, and contributed to their biodiversity value. Sometimes they have also been used for grazing after the hay harvest. Silt transported by river water is the main nutrient source with no additional fertilization applied. Techniques to regulate or dam the river flow in order to increase the inundated area or the length of the period of flooding were developed. The meadows are important bird habitats, but as mowing has largely been abandoned they are becoming overgrown with scrub and trees. In some cases large-scale regulation of rivers for hydroelectric power has destroyed the natural flood regime which is indispensable for the maintenance of this habitat. <b>Distribution:</b> northern European Boreal region in Sweden, Finland and Baltic States (plus a few sites in Swedish alpine region).	f	454 km <sup>2</sup> SAC: 18%	<b>UFC:</b> 100% <b>XX:</b> 0%
6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	Species-rich hay meadows at low to submontane altitudes belonging to the <i>Arrhenatherion</i> and the <i>Brachypodio-Centaureion nemoralis</i> alliances. They are mown after most of the plants have flowered. They are mesotrophic communities naturally fertilised by floods so tolerate low fertilisation, but frequent or heavy fertilisation quickly reduces the species diversity. Abandonment leads to <i>Arrhenatherum</i> dominated fallow communities. These meadows are important for a wide range of invertebrates as well as plants. <b>Distribution:</b> widespread in central and northern Europe in all biogeographic regions, more rarely in the Mediterranean region but not reported from Macaronesia.	f	14,737 km <sup>2</sup> (+BG& RO) SAC: 46%	<b>UFC:</b> 89% <b>XX:</b> 6%
6520	Mountain hay meadows	Species-rich hay meadows at higher altitudes (usually 600m or higher), often in mountain valleys. These meadows are traditionally managed for hay production and are often very species-rich. <b>Distribution:</b> most widespread in the hills and mountains of central Europe; also occurs in other	f	2,257 km <sup>2</sup> (+BG&	<b>UFC:</b> 99% <b>XX:</b>

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
		mountain ranges such as the Pyrenees, Massif Central and the hills of the UK and Fenno-Scandinavia.		RO) SAC: 51%	1%
6530	Fennoscandian wooded meadows (priority habitat)	This habitat typically consists of a mosaic of deciduous trees, bushes such as hazel ( <i>Corylus avellana</i> ) and more or less open glades with grass. The species composition varies depending on the region. The field layer includes many species which are dependent on regular mowing, eg <i>Scorzonera humilis</i> . Other typical species are <i>Dactylorhiza maculata ssp.fuchsii</i> , <i>Orchis mascula</i> , <i>Primula veris</i> , <i>Saussurea alpina</i> . The habitat is rich in insect species and important for some rare plant species such as <i>Euphrasia stricta</i> var. <i>suecica</i> . Traditionally these meadows with small copses of deciduous trees and scrub were managed by mowing, and the hay harvest was often followed by grazing. Pollarding was a common practice, and the leaves and twigs normally harvested for animal feed every few years. In spring the meadow was cleared of dead leaves, fallen branches etc. The tree layer (especially alder) and pollarding practices had a fertilising function and benefited the hay production, but today overgrowth and excessive nutrient levels are common problems, and the habitat is not considered to tolerate any fertilisation. <b>Distribution:</b> restricted to Boreal region, especially the area surrounding the Baltic proper, together with adjacent parts of the Continental region in southern Sweden. Similar meadows with a rich content of pollarded trees have however been present in other parts of Europe as well, especially in mountainous areas, and remnants can still be found eg in the Carpathian mountains.	f	53 km <sup>2</sup> SAC: 54%	<b>UFC:</b> 100% <b>XX:</b> 0%
<b>RAISED BOGS AND MIRES AND FENS</b>					
7210	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricon davalliana</i> (priority habitat)	Great fen sedge ( <i>Cladium mariscus</i> ) beds on the emergent-plant zones of lakes, or as a result of succession on fallow land or extensively farmed wet meadows, often in association with other wetland habitats such as reed beds, fens and humid grasslands. Typical species are <i>Schoenus nigricans</i> and species of the <i>Caricon davalliana</i> community. Dependence on grazing or mowing varies from region to region. Abandonment leads to <i>Phragmites</i> and <i>Cladium</i> fallows, colonized by <i>Salix</i> shrubs. <b>Distribution:</b> widespread, but local, throughout Europe although absent from the north of Fenno-scandinavia and from Macaronesia.	p/n	359 km <sup>2</sup> (+BG& RO) SAC: 26%	<b>UFC:</b> 71% <b>XX:</b> 2%
7230	Alkaline fens	Alkaline fens are mires dominated by peat- or tufa-producing small sedge ( <i>Carex</i> spp., particularly <i>Carex davalliana</i> ) and brown moss communities developed on soils permanently waterlogged by base-rich ground water or surface water at or just below the surface, with minimal water level fluctuation. In Central Europe calcium-tolerant <i>Sphagnum</i> mosses are dominant. The dividing line between rich fen with peat-forming mosses and peaty fen meadow with sedges is unclear, and the two often occur	p	9,941 km <sup>2</sup> (+BG& RO)	<b>UFC:</b> 97% <b>XX:</b> 0%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km <sup>2</sup> )* % within SACs*	% UFC % XX
		<p>alongside each other. Usually found associated with calcareous fens (7210), <i>Molinia</i> meadows (6410) or <i>Calthion palustris</i> wet hay meadows (also known as fen meadows), reed beds, transition mires or spring-fed fens. The vegetation is rich in Annex II and IV species. Important for rare invertebrates e.g. butterflies (<i>Phengaris/Maculinea</i> spp., <i>Coenonympha oedippus</i>, <i>Lycaena dispar</i>), dragonflies, <i>Vertigo</i> snails. Breeding habitat of the very rare Aquatic Warbler (<i>Acrocephalus paludicola</i>). Very sensitive to changes in hydrology/hydrochemistry and land-use in surrounding area, plus airborne pollutants. Almost all fens have been slightly drained and traditional uses as meadows for bedding or low quality forage, or as extensive summer pastures, have prevented succession. Fens are sensitive to trampling and heavy machinery.</p> <p><b>Distribution:</b> alkaline fens occur where the groundwater is suitable throughout Europe but are rare in the south. Sites for Romania and Bulgaria have not yet been designated.</p>		SAC: 43%	
<b>ROCKY HABITATS</b>					
8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	<p>Pioneer communities of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii alliances, colonising superficial soils of siliceous rock surfaces. The soil on the relatively flat or slightly inclining rocks is normally very thin with poor water storage capacity. As a consequence, the habitat is often subjected to severe drought during much of the vegetation period. The sparse low vegetation is characterised by mosses, lichens, succulent and annual plant species. Includes both natural and secondary habitats, typically in mosaic with other habitats. Secondary habitats were created &amp; are maintained by sheep or goat grazing as small patches in pastures.</p> <p><b>Distribution:</b> patchy distribution in most of the biogeographic regions.</p>	p/n	2,797 km <sup>2</sup> (+BG&RO)  SAC: 21-92%	<b>UFC:</b> 9% <b>XX/XU:</b> 82%
8240	Limestone pavements ( <i>priority habitat</i> )	<p>Limestone pavements have more or less horizontal outcrops of stone which are broken by cracks of varying width and depth in which vegetation can develop. Often this vegetation is related to that found in woodlands although often the trees are absent. Overall, there is usually considerably less than 50% soil cover, but some are now very wooded over. Often needs either grazing or coppicing to keep it open.</p> <p><b>Distribution:</b> found in areas of karst across Europe in most of the biogeographic regions.</p>	p	1,466 km <sup>2</sup>  SAC: 47%	<b>UFC:</b> 27% <b>XX:</b> 37%
<b>FORESTS</b>					
9070	Fennoscandian wooded pastures	<p>The major ecological factor determining this type of habitat is the occurrence of old trees and continuous use as pasture. These are the wooded part of the traditional outfield pastures, and vary greatly in dominant tree species, tree density, and dominant ground vegetation. The practice of grazing forests was widespread until the early 20<sup>th</sup> century. An unbroken continuity of trees over a long time period is characteristic, but the habitat can also have a younger tree layer – as in the subtype with birch</p>	f	508 km <sup>2</sup>  SAC: 19%	<b>UFC:</b> 100% <b>XX:</b> 0%

Code	Habitat name & priority status	Description / distribution	Agri dep	Extent (km2)* % within SACs*	% UFC % XX
		<p>pastures that developed after slash-and-burn cultivation, or can have originated as a meadow. The habitat is composed of a mosaic of grazed forest, copses, sparse trees and patches of open grassland. Wooded pastures are usually dominated by birch (<i>Betula</i> spp), pine (<i>Pinus sylvestris</i>), alder (<i>Alnus incana</i>) or spruce (<i>Picea abies</i>); in the hemi-boreal zones there are also subtypes dominated by oak (<i>Quercus robur</i>), ash (<i>Fraxinus excelsior</i>), other broad-leaved trees, or hazel (<i>Corylus avellana</i>). Typical grassland species are <i>Ajuga pyramidalis</i>, <i>Dactylorhiza viridis</i>, <i>Danthonia decumbens</i>, <i>Lathyrus linifolius</i>, and <i>Primula veris</i>. The habitat is rich in dead and decaying wood and maintains threatened invertebrate and fungal species.</p> <p><b>Distribution:</b> Boreal region and adjacent Continental and Alpine areas in Sweden, Finland, and Baltic States. One of the three subtypes, maintained in central and eastern Finland by slash and burn techniques, is now very rare (only 300 ha remain). A subtype dominated by old and large oak trees is especially species rich, and mainly occurs in south-eastern parts of the Boreal region and adjacent parts of the Continental region in Sweden.</p>			

## Annex B Key species of Community interest associated with farmland

This table shows the species of Community interest from Annex II of the Habitats Directive and bird species from Annex I of the Birds Directive that are associated with agricultural habitats. It lists their agricultural habitat use, their priority status, their current conservation status, and some references giving information about status and pressures.

### PLANTS, INVERTEBRATES, AMPHIBIANS, REPTILES, MAMMALS:

The species list follows Appendix III of the Biodiversity Baseline report (EEA, 2010).

Grass use = is the species present on grassland? Appendix III of the Biodiversity Baseline report (EEA, 2010)

Agri use = is the species present on arable land? Appendix III of the Biodiversity Baseline report (EEA, 2010)

Priority species = identified as priority species in Annex II of the Habitats Directive (species in need of special measures such as the preparation of species actions plans)

Conservation Status = ETC/BD biogeographical assessment for EU-25. FV = Favourable Status; U1 = Unfavourable-Inadequate; U2 = Unfavourable-Bad; XX = unknown; XXn = not assessed because recently added to Habitats Directive (mainly for Romania and/or Bulgaria). If two or more status assessments are listed, these are because the assessments differ in different biogeographical zones.

EU-27 red list status according to IUCN (2012). CR = critically threatened. EN = endangered. VU = vulnerable. NT = near threatened. LC = least concern. DD = data deficient. n/a = not applicable (eg subspecies has no separate status assigned). Some invertebrate groups have not yet been evaluated.

Member States = presence in EU-27 Member States as reported under Article 17 or in checklist for RO and BG or by IUCN (EU25 MS in brackets did not report on the species under Article 17 but other references report presence)

Sources:

ETC/BD (2008) Article 17 species summaries. <http://bd.eionet.europa.eu/article17/speciessummary/>

EEA (2010) EU 2010 Biodiversity Baseline. EEA Technical Report No 12/2010, European Environment Agency, Copenhagen.

IUCN (2012) IUCN European Red List of Threatened Species. Version 2012.2. <http://www.iucnredlist.org/initiatives/europe>

ETC/BD (2012) Species check list. [http://bd.eionet.europa.eu/article17/reference\\_portal](http://bd.eionet.europa.eu/article17/reference_portal)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<b>PLANTS</b>									
<i>Aconitum napellus ssp. corsicum</i> ( <i>Aconitum corsicum</i> )		Y			U1	VU	FR	4060, 6230, 6430	(INPN, 2011; IUCN, 2012)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Adonis distorta</i>		Y			FV	DD	IT	6210	(ANPA, 2001; IUCN, 2012)
<i>Anacamptis pyramidalis*</i> ( <i>Anacamptis urvilleana</i> )	Maltese Pyramidal Orchid	Y			XX	LC	EL, MT		(IUCN, 2012)
<i>Angelica palustris</i>		Y			U1/U2/XXn	DD	BG, EE, HU, LV, PL, CZ, DE, SK	6410, 6440, 7230	(BfN, 2011; Cerovský et al, 1999; IUCN, 2012; Rybka et al, 2005) LIFE02/NAT/H/8630
<i>Artemisia granatensis</i>	Manzanilla de Sierra Nevada	Y		Y	XX	EN	ES	6160	(IUCN, 2011; Ministerio de Medio Ambiente y Medio Rural y Marino, 2011a; Peñas et al, 2011; VV.AA, 2009)
<i>Artemisia laciniata</i>	Schlitzblättriger Beifuß	Y	Y	Y	U2	CR	AT		(IUCN, 2012)
<i>Artemisia oelandica</i>	Alvarmalört	Y			U2/FV	NT	SE	6210, 6280	(European Commission, 2007; IUCN, 2012; SLU, 2011)
<i>Artemisia pancicii</i>	Palina Pančičova	Y		Y	U2	VU	AT, CZ	6210, 6240	(Calaciura and Spinelli, 2008; Cerovský et al, 1999; IUCN, 2012)
<i>Aster pyrenaeus</i>	Aster des Pyrénées	Y		Y	U1/XX	EN	ES, FR	6170, 6210	(Bensettiti et al, 2010; IUCN, 2012; Ministerio de Medio Ambiente y Medio Rural y Marino,

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
									2011a)
<i>Aster sorrentinii</i>	L'astro di Sorrentino	Y		Y	FV	EN	IT	6220	(IUCN, 2012; San Miguel, 2008)
<i>Astragalus algarbiensis</i>		Y	Y	Y	XX	DD	PT (ES)		(ICNB, 2006; IUCN, 2012)
<i>Astragalus aquilanus</i>	Astragalo dell'Aquila	Y		Y	XX	DD	IT	6210	(Calaciura & Spinelli, 2008; IUCN, 2012)
<i>Astragalus alopecurus</i> ( <i>Astragalus centralpinus</i> )*		Y	Y		U1/U2/XXn	DD	FR, IT, BG		(Cremene, 2011; IUCN, 2012)
<i>Astragalus peterfii</i>		Y			XXn	DD	RO	4060, 5130, 6210, 6240	(IUCN, 2012; Ivorra Jiménez and García Torres, 2011; VV.AA, 2009)
<i>Astragalus tremolsianus</i>		Y			XX	CR	ES	4090	(IUCN, 2012; San Miguel, 2008)
<i>Astragalus verrucosus</i>	Astragalo Verrucoso	Y		Y	U1	CR	IT	6220	(Cremene, 2011; IUCN, 2012)
<i>Biscutella neustriaca</i>	Lunetière de Neustrie	Y		Y	U2	VU	FR	6110, 6210	(INPN, 2011; IUCN, 2012)
<i>Braya linearis</i>	Fjällkrasse	Y			FV	VU	SE	6170	(IUCN, 2012; SLU, 2011; Swedish

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
									Environmental Protection Agency, 2003)
<i>Bromus grossus</i>	Brome Épais, Spelz-Trespe		Y		U2/XX	DD	BE, DE, IT (AT, LU)	arable	(BfN, 2011; IUCN, 2012; Observatoire de la Faune, de la Flore et des Habitats, 2011)
<i>Campanula bohemica</i>	Zvonek Český	Y		Y	U1	NT	CZ, PL	6150, 6230, 6520	(AOPK CR, 2007; IUCN, 2012; Rybka et al, 2005; Skálová et al, 1999)
<i>Campanula bohemica ssp gelida (Campanula gelida)</i>	Zvonek Jesenický	Y		Y	U2	CR	CZ	6150	(Cerovský et al, 1999; IUCN, 2012)
<i>Campanula romanica</i>	Romanian /Dobruja Bellflower / Clopoşelul Dobrogean	Y			XXn	DD	RO		(IUCN, 2012)
<i>Campanula serrata</i>		Y		Y	U1/XXn	LC	PL, SK, RO	4060, 6150, 6230, 6520	(Goliášová et al, 2008; IUCN, 2012)
<i>Carduus myriacanthus</i>	Cardo Costero	Y		Y	XX	EN	ES	6310	(IUCN, 2012; VV.AA, 2009)
<i>Carex holostoma</i>		Y			FV	LC	FI, SE	6150	(IUCN, 2012; SLU, 2011)
<i>Carlina onopordifolia</i>	Dziewięciślił Popłocholistny	Y			U1	VU	PL	5130, 6120	(IUCN, 2012)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Centaurea jankae</i>		Y			XXn	VU	RO, BG	6110	(Basnou et al, 2009; IUCN, 2012; Sarbu et al, 2004; Sarbu, 2004)
<i>Centaurea lactiflora</i>		Y		Y	XX	NT	EL	6220	(IUCN, 2012)
<i>Centaurea micrantha ssp. herminii</i>		Y			XX	LC	PT	9230	(Birdlife International, 2011; ICNB, 2006)
<i>Centaurea pontica</i>		Y			XXn	DD	RO		(IUCN, 2012)
<i>Centaurea rothmalerana</i>		Y			XX	DD	PT		(IUCN, 2012)
<i>Cerastium alsinifolium</i>		Y		Y	U1	DD	CZ		(AOPK CR, 2007; Cerovský et al, 1999; IUCN, 2012; Rybka et al, 2005)
<i>Colchicum arenarium</i>	Sand Saffron	Y			U1	LC	HU, SK	6120, 6260	(IUCN, 2012; ŠeffEROVÁ et al, 2008a)
<i>Corydalis gotlandica</i>		Y			FV	NT	SE	6210, 9070	(IUCN, 2012; SLU, 2011)
<i>Crambe tataria</i>	Katrán tatarský	Y			U1	LC	SK, CZ, IT, HU	6240, 6250, 62C0	(Cerovský et al, 1999; European Commission, 2007; Illyés and Csatho, 2007; IUCN, 2012; Rybka et al, 2005)
<i>Dactylorhiza kalopissii</i>		Y			XXn	EN	EL	7230	(IUCN, 2012)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Daphne arbuscula</i>		Y		Y	FV	DD	SK	6170	(Cerovský et al, 1999; IUCN, 2012; Sundseth, 2009a)
<i>Dianthus arenarius ssp bohemicus*</i>		Y		Y	U2	DD	CZ	2330, 6120	(Cerovský et al, 1999; Rybka et al, 2005)
<i>Dianthus diutinus</i>		Y		Y	U2	EN	HU	6260	(IUCN, 2012; ŠeffEROVÁ et al, 2008a)
<i>Dianthus marizii</i>		Y			XX	LC	PT	6160	(ICNB, 2006; IUCN, 2012)
<i>Dianthus moravicus</i>		Y		Y	U1/U2	DD	CZ	6190, 6110	(Cerovský et al, 1999; IUCN, 2012; Rybka et al, 2005)
<i>Dianthus nitidus</i>		Y		Y	U1	NT	SK	91Q0, 6170	(European Commission, 2007; IUCN, 2012; Ministry of the Environment of the Slovak Republic, 1998; Polák and Saxa, 2005)
<i>Dianthus plumarius ssp. regis-stephani*</i>		Y			U1	LC	HU (SK, AT, CZ)	6190, 6240	(CEEweb, 2011; IUCN, 2012)
<i>DiploTaxis ibicensis</i>		Y			XX	LC	ES		(IUCN, 2012)
<i>Dracocephalum austriacum</i>		Y			U1/FV	DD	IT, FR, SK, HU, AT, ES, SK, CZ	6210, 6240	(Illyés & Csatho, 2007; INPN, 2011; IUCN, 2012; Šuvada, 2011)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Echium russicum</i>	Piros Kígyószisz	Y			U2/FV	LC	CZ, PL, SK, HU (AT)	6110, 6210, 6240, 6250, 6510	(Baranska et al, 2009; Cerovský et al, 1999; IUCN, 2012)
<i>Eryngium alpinum</i>	Alpen-Mannstreu	Y			U1	NT	AT, FR, IT, SI	6170, 6230, 6520	(INPN, 2011; IUCN, 2012)
<i>Euphrasia genargentea</i>		Y		Y	U1	LC	FR, IT	4090,6150,6230	(IUCN, 2012)
<i>Ferula sadleriana</i>		Y		Y	U1/XXn	EN	HU, SK, RO	6190, 6210	(Cerovský et al, 1999; IUCN, 2012; Polák & Saxa, 2005)
<i>Festuca duriotagana</i>		Y			U1	DD	PT	6160	(ICNB, 2006; IUCN, 2012)
<i>Festuca elegans</i>		Y			XX	LC	PT, ES	6220, 6310	(ICNB, 2006; IUCN, 2012; VV.AA, 2009)
<i>Festuca henriquesii</i>		Y			XX	LC	PT	6160, 6230	(ICNB, 2006; IUCN, 2012)
<i>Festuca summilusitana</i>		Y			XX/U1	LC	PT, ES	4090, 5120, 6160, 6220	(ICNB, 2006; IUCN, 2012; VV.AA, 2009)
<i>Galium cracoviense</i>		Y			XX	VU	PL		(Cieslak and Szlag, 2009; IUCN, 2012)
<i>Galium moldavicum</i>		Y			XXn	DD	RO	6240	(Hady Land Association, 2008; IUCN, 2012)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Galium sudeticum</i>		Y		Y	U1/XXn	VU	CZ, PL, RO	6150, 6230, 6430	(Cerovský et al, 1999; IUCN, 2012)
<i>Gentiana ligustica</i>		Y			FV	LC	FR, IT	6110, 6170, 6210, 8240	(INPN, 2011; IUCN, 2012)
<i>Gentianella anglica</i> *	Early Gentian	Y	Y		U1	DD	UK	6210	(Calaciura & Spinelli, 2008; IUCN, 2012; JNCC, 2007a)
<i>Gentianella bohemica</i>	Boehmischer Enzian	Y		Y	U2	VU	CZ, DE, PL (AT)	6230, 6520	(BfN, 2011; Cerovský et al, 1999; IUCN, 2012; Rybka et al, 2005)
<i>Gladiolus palustris</i>	Marsh Gladiolus	Y			U1/U1/ U2/FV	DD	CZ, DE, FR, HU, IT, PL, SI, SK	62A0, 6260, 6410, 6440	(BfN, 2011; Cerovský et al, 1999; IUCN, 2012)
<i>Gymnadenia runei</i> ( <i>Gymnigritella runei</i> )		Y			FV	NT	SE	6170	(IUCN, 2012; SLU, 2011)
<i>Gypsophila papillosa</i>		Y		Y	FV	EN	IT	8120	(IUCN, 2012)
<i>Herniaria maritima</i>		Y			XX	LC	PT	2130, 2330	(ICNB, 2006; IUCN, 2012)
<i>Hladnikia pastinacifolia</i>		Y			FV	DD	SI	62A0	(European Commission, 2007; IUCN, 2012)
<i>Holcus setiglumis ssp duriensis</i>		Y			XX	DD	PT, ES		(ICNB, 2006; VV.AA, 2009)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Iberis procumbens</i> ssp <i>microcarpa</i>		Y			XX	DD	PT	5330, 6110	(ICNB, 2006; VV.AA, 2009)
<i>Ionopsidium savianum</i> ( <i>Jonopsidium savianum</i> )	Bivonea di Savi	Y			XX	NT	ES, IT		(ETC/BD, 2008; IUCN, 2012)
<i>Iris aphylla</i> ssp <i>hungarica</i>		Y			U1	DD	HU, SK	6260, 91Q0, 6190	(European Commission, 2007; Polák & Saxa, 2005)
<i>Iris humilis</i> ( <i>Iris humilis</i> ssp <i>arenaria</i> )		Y			U1	DD	CZ, HU, SK	6120, 6190, 6260	(CEEweb, 2011; Cerovský et al, 1999; European Commission, 2007; IUCN, 2012; Rybka et al, 2005)
<i>Jurinea cyanoides</i>	Sand-Silberscharte	Y		Y	U1/U2	LC	CZ, DE	2330 (CZ), 6120 (DE)	(BfN, 2011; IUCN, 2012; Rybka et al, 2005)
<i>Klasea lycopodifolia</i> ( <i>Serratula lycopodifolia</i> )		Y		Y	U1/U2	DD	CZ, FR, HU, PL, SI, SK	6210 (CZ, SK), 62A0 (SI)	(IUCN, 2012; Polák & Saxa, 2005)
<i>Lamyropsis microcephala</i>		Y		Y	U1	CR	IT	4090	(ANPA, 2001; Bacchetta et al, 2007; IUCN, 2012)
<i>Leontodon microcephalus</i>		Y			XX	VU	ES	6160	(Blanca et al, 2000; IUCN, 2012; VV.AA, 2009)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Leontodon siculus</i>		Y		Y	FV	NT	IT	6510	(ANPA, 2001; IUCN, 2012; Regione Siciliana, 2011)
<i>Linaria ricardoii</i>			Y	Y	XX	NT	PT		(ICNB, 2006; IUCN, 2012)
<i>Linum dolomiticum</i>		Y			FV	DD	HU	6190, 6240	(European Commission, 2007; IUCN, 2012)
<i>Linum muelleri</i>		Y			FV	VU	IT	1410	(IUCN, 2012; McCorry and Ryle, 2009)
<i>Lythrum flexuosum</i>	Jopillo	Y			XX	NT	ES	3170	(IUCN, 2012; Ministerio de Medio Ambiente y Medio Rural y Marino, 2011b; VV.AA, 2009)
<i>Minuartia smejkalii*</i>		Y		Y	U2	DD	CZ		(Cerovský et al, 1999; IUCN, 2012)
<i>Moehringia jankae</i>		Y			XXn	DD	RO	40C0	(European Commission, 2007; IUCN, 2012; Sundseth, 2009b)
<i>Narcissus asturiensis</i>		Y			XX/U2	LC	ES, PT	4020, 4030, 6230, 6510, 6520, 8240	(ICNB, 2006; IUCN, 2012)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Narcissus nevadensis</i>		Y		Y	U2	EN	ES	6420	(IUCN, 2012; Ministerio de Medio Ambiente y Medio Rural y Marino, 2011a)
<i>Narcissus pseudonarcissus ssp nobilis</i>		Y			XX	LC	ES, PT	9150, 9230 (ES), 6170, 6520 (PT)	(ICNB, 2006)
<i>Narcissus viridiflorus</i>		Y			XX	DD	ES	6310	(ICNB, 2006; IUCN, 2012; Lozano et al, 1996)
<i>Notothylas orbicularis</i>	Kugel-Hornmoos		Y		U2	n/a	DE, AT (CZ)		(BfN, 2011; Koval, 2011)
<i>Ononis maweana (Ononis hackelii)</i>		Y		Y	XX	NT	PT	6310	(ICNB, 2006; IUCN, 2012)
<i>Onosma tornensis*</i>		Y			U1	EN	SK, HU	6190, 6210, 6240	(Cеровský et al, 1999; IUCN, 2012; Ministry of the Environment of the Slovak Republic, 1998; Šeffler et al, 2002)
<i>Ophrys kotschyi</i>		Y			FV	NT	CY	5330, 5420, 6220	(Fuller et al, 2010a; Fuller et al, 2010b; Fuller et al, 2011; IUCN, 2012)
<i>Papaver radicum ssp hyperboreum (Papaver laestadianum)*</i>		Y			FV	NT	SE		(SLU, 2011)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Pinguicula nevadensis</i>	Estrella de las Nieves	Y			XX	EN	ES	6160	(Blanca, 2001; IUCN, 2012; VV.AA, 2009)
<i>Platanthera obtusata ssp oligantha</i>		Y			FV	EN	SE	6170	(IUCN, 2012; SLU, 2011)
<i>Potentilla delphinensis</i>		Y			U1	VU	FR	6170, 6520	(INPN, 2011; IUCN, 2012)
<i>Potentilla emilii-popii</i>		Y			XXn	DD	BG, RO		(EEA, 2006; IUCN, 2012; Sundseth, 2009b)
<i>Primula scandinavica</i>	Fjällviva	Y			FV	VU	SE	6150, 2130	(IUCN, 2012; Ronningen et al, 2005; SLU, 2011; Wehn, 2008)
<i>Puccinellia phryganodes</i>		Y			U2	CR	FI	1630	(Doody, 2008; European Commission, 2007; IUCN, 2012)
<i>Puccinellia pungens</i>		Y			U1	VU	ES	1340, 1410	(IUCN, 2012; Ministerio de Medio Ambiente y Medio Rural y Marino, 2011a)
<i>Pulsatilla grandis</i>	Large Pasque Flower	Y			U1	LC	CZ, HU, SK, SI (AT, DE)	4030, 6190, 6210, 6240, 6250, 6520	(Calaciura & Spinelli, 2008; European Commission, 2007; IUCN, 2012; Kaligaric et al, 2006; Rybka et al, 2005; Turis and Galvánek, 2003)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Pulsatilla patens</i>	Eastern Pasque Flower	Y			U1/U2/XXn	DD	CZ, DE, EE, FI, HU, LT, LV, PL, RO, SE, SK	4030, 40A0, 6110, 6210, 6260	(Cerovský et al, 1999; Eriksson and Rosén, 2008; European Commission, 2007; IUCN, 2012)
<i>Pulsatilla pratensis ssp hungarica</i>	Hungarian Small Pasque Flower	Y			U2	DD	HU, SK	6260, 5130, 6190, 6210 (CZ), 6150, 6240 (SK)	(Cerovský et al, 1999; ŠeffEROVÁ et al, 2008a)
<i>Pulsatilla slavica</i>	Haller's Pasque Flower	Y			U1	DD	PL, SK	6110, 6170, 6190, 6210	(Calaciura & Spinelli, 2008; European Commission, 2007; IUCN, 2012; Polák & Saxa, 2005)
<i>Pulsatilla subslavica</i>	Poniklec prostredný	Y			U1/XX	DD	SK	6240, 6190, 6210	(IUCN, 2012; Turis & GalvÁnek, 2003; Various, 2010)
<i>Ranunculus weyleri</i>	Weyler's Buttercup	Y			XX	VU	ES		(IUCN, 2012; Ministerio de Medio Ambiente y Medio Rural y Marino, 2011c)
<i>Santolina semidentata</i>		Y			XX	LC	PT, ES	4090, 6170, 6210	(ICNB, 2006; IUCN, 2012)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Scilla litardierei</i>	Dalmatian Scilla	Y	Y		U1	CR	SI		(IUCN, 2012; Kazakova and Stefanova, 2010)
<i>Senecio elodes</i>	Cineraria de Sierra Nevada	Y		Y	XX	EN	ES	6220	(Blanca, 2001; IUCN, 2012; Ministerio de Medio Ambiente y Medio Rural y Marino, 2011a)
<i>Seseli leucospermum</i>		Y			FV	NT	HU	6190	(European Commission, 2007; Fábíán and Iványi, 2010; IUCN, 2012)
<i>Stipa austroitalica</i>		Y		Y	FV	LC	IT	6220, 6210	(IUCN, 2012)
<i>Stipa bavarica</i>	Bayerisches Federgras	Y		Y	FV	VU	DE	8210 (CZ)	(BfN, 2011; IUCN, 2012)
<i>Stipa danubialis</i>		Y			XXn	DD	RO		(IUCN, 2012; WWF, 2008)
<i>Stipa styriaca</i>	Steirisches Federgras	Y		Y	U1	EN	AT	6240	(IUCN, 2012)
<i>Stipa zalesskii</i>		Y		Y	U1	VU	CZ	6210, 6260	(AOPK CR, 2007; European Commission, 2010a; IUCN, 2012; Rybka et al, 2005)
<i>Tephroseris longifolia ssp moravica</i>		Y			U1/U2	VU	CZ, SK	6210	(Cerovský et al, 1999; Rybka et al, 2005)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Thlaspi jankae</i> ( <i>Noccaea jankae</i> )*		Y			U1/FV/XXn	NT	HU, RO, SK	6110, 6210, 6240, <b>6250</b>	(Illyés & Csatho, 2007; IUCN, 2012)
<i>Tulipa hungarica</i>	Hungarian Tulip, Sárga Tulipán	Y			XXn	NT	RO		(IUCN, 2012; WWF, 2008)
<i>Vincetoxicum pannonicum</i>		Y			U1	VU	HU (SK?, CZ?)	6190	(EEA, 2008; European Commission, 2007; Government of Hungary, 1995; IUCN, 2012)
<b>INVERTEBRATES</b>									
<i>Baetica ustulata</i>	(grasshopper)	Y			XX		ES	4090, <b>6160</b>	(ETC/BD, 2008; VV.AA, 2009)
<i>Bolbelasmus unicornis</i>	(scarab beetle)	Y			U2/XX		FR, SI, SK, EL, CZ, HU		(ETC/BD, 2008)
<i>Brachytrupes megacephalus</i>	(grasshopper)	Y			U2		MT	2250	(ETC/BD, 2008)
<i>Carabus hungaricus</i>	A magyar futrinka	Y			U2/FV		CZ, HU, SK	6260, 6240, 6250	(AOPK CR, 2007; Šeffferová et al, 2008a)
<i>Carabus zawadzskii</i>	Zempléni futrinka	Y			U1/XX /FV/XXn		PL, SK, HU, RO		(ETC/BD, 2008)
<i>Caseolus calculus</i>	Madeiran Land Snail	Y			XX	VU	PT		(ICNB, 2008; ICNB, 2009; IUCN, 2012)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Caseolus subcalliferus</i> ( <i>Caseolus sphaerula</i> )	Madeiran Land Snail	Y			U2	CR	PT		(ICNB, 2008; IUCN, 2012)
<i>Catopta</i> ( <i>Paracossulus</i> ) <i>thrips</i>	(carpenter moth Cossioidea)	Y			U1/XX /XXn		HU, RO, BG, EL (SK)	1530, 6260	(ŠeffEROV et al, 2008b)
<i>Chondrosoma fiduciarium</i>	(geometrid moth)	Y			U2		HU		(ETC/BD, 2008)
<i>Clossiana improba</i> ( <i>Boloria improba</i> )	Dusky-winged Fritillary	Y			U2	EN	SE, FI	6170	(Butterfly Conservation Europe, 2010; SLU, 2011; van Swaay et al, 2010b)
<i>Coenonympha oedippus</i>	False Ringlet	Y			U2/U1	EN	AT, IT, FR, SI, HU, PL	6410, 7120, <b>7210</b> , 7230	(INPN, 2011; ŠeffEROV et al, 2008c; van Swaay et al, 2006; van Swaay et al, 2010b)
<i>Colias myrmidone</i>	Danube Clouded Yellow	Y	Y		U2/U1	EN	HU, SI, SK, PL, CZ	diverse..	(European Commission, 2010b; van Swaay et al, 2010a; van Swaay et al, 2010b)
<i>Cucullia mixta</i>	(noctuid moth)	Y			U2		HU	1530	(ETC/BD, 2008)
<i>Discula tabellata</i>	Madeiran Land Snail	Y			XX	CR	PT		(ICNB, 2008)
<i>Dorcadion fulvum cervae</i> ( <i>Carinatodorcadion fulvum cervae</i> )	(longhorn beetle)	Y			FV	n/a	HU		(Andras and Otto, 2005)
<i>Elona quimperiana</i>	Escargot de Quimper	Y			XX	LC	FR, ES	4020, 9120	(INPN, 2011)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Erebia calcaria</i>	Lorkovic's Brassy Ringlet	Y			U1	LC	IT, SI, AT	6170, 6230	(van Swaay et al, 2010a; van Swaay et al, 2010b)
<i>Erebia christi</i>	Raetzer's Ringlet	Y			U2	VU	IT	6230	(van Swaay et al, 2010a; van Swaay et al, 2010b)
<i>Erebia medusa polaris</i>	Arctic Woodland Ringlet	Y			U1	LC	FI	6170, 6210	(van Swaay et al, 2010b)
<i>Euphydryas aurinia</i>	Marsh Fritillary	Y			U2/U1 /XX	LC	AT, BE, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, IT, LT, LU, LV, PL, PT, SE, SI, SK, UK	6210, 6410, 7110, 7120, 7140, 7210, 7230	(INPN, 2011; JNCC, 2007b; Pihl et al, 2001; van Swaay et al, 2006; Zimmermann et al, 2011)
<i>Glyphipterix loricatella</i>	(moth of the Glyphipterigidae)	Y			U2/XXn		HU, RO		(ETC/BD, 2008; Goruip, 2008; Mihut and Dinca, 2006)
<i>Gortyna borelii lunata</i>	Fisher's Estuarine Moth	Y			U2/U1/ FV/XX		DE, FR, HU, UK	1530	(Šefferoová et al, 2008b)
<i>Helicopsis striata austriaca</i>	(snail)	Y	Y	Y	U2	LC (CR in AT)	AT	1530, 8240? (SE)	(European Commission, 2007; Šefferoová et al, 2008b)
<i>Hesperia comma catena</i>	Silver-spotted Skipper	Y			U2	n/a	SE, FI	6210, 6230, 6270 (SE)	(SLU, 2011; van Swaay et al, 2010b)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Isophya costata</i> *	(cricket)	Y			U1	DD	HU		(ETC/BD, 2008)
<i>Isophya harzi</i> *	(cricket)	Y			XXn	DD	HU		
<i>Isophya stysi</i> *	(cricket)	Y			U1	DD	HU, SK	6510, 6520	(ETC/BD, 2008)
<i>Lignyoptera fumidaria</i>	(geometrid moth)	Y			U1	DD	HU	1530, 6240	(ETC/BD, 2008)
<i>Lycaena dispar</i>	Large Copper	Y	Y		U1/FV/XX	LC	AT, BE, CZ, DE, EE, EL, FR, FI, IT, LT, LV, LU, NL, PL, SI, SK	1530, <b>6430</b> , 450 (LT), 7140 (NL)	(European Commission, 2007; INPN, 2011; Pihl et al, 2001; ŠeffEROVÁ et al, 2008b; van Swaay et al, 2010b)
<i>Lycaena helle</i>	Violet Copper	Y			U2	EN	BE, DE, FI, FR, LT, PL, SE	6410	(BfN, 2011; van Swaay et al, 2006; van Swaay et al, 2010b)
<i>Phengaris (Maculinea) nausithous</i>	Dusky Large Blue	Y	Y		U1/U2	NT	AT, CZ, DE, ES, FR, HU, NL, PL, SI, SK	6410, 6510, <b>7210</b> , 7230	(INPN, 2011; van Swaay et al, 2006; van Swaay et al, 2010b)
<i>Phengaris (Maculinea) teleius</i>	Scarce Large Blue	Y	Y		U2/U1/FV	VU	AT, CZ, DE, FR, HU, IT, NL, LT, LV, PL, SI, SK	6410, 6510, <b>7210</b> , 7230	(INPN, 2011; van Swaay et al, 2006; van Swaay et al, 2010b)
<i>Melanargia arge</i>	Italian Marbled White	Y			FV/U1	LC	IT	5130, 6210	(van Swaay et al, 2010a; van Swaay et al, 2010b)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Myrmecophilus baronii</i>	(cricket)	Y			U1		MT		(ETC/BD, 2008)
<i>Paracaloptenus caloptenoides</i>	(cricket)	Y	Y		XX/U1		EL, HU, SK		(ETC/BD, 2008)
<i>Phyllometra culminaria</i>	(geometrid moth)	Y			U1		HU		
<i>Pilemia tigrina</i>	(longhorn beetle)	Y			U1		HU	6210, 6240, 6250	(Illyés & Csatho, 2007)
<i>Plebicula golgus (Polyommatus golgus)</i>	Sierra Nevada Blue	Y			XX	VU	ES	<b>6160</b>	(van Swaay et al, 2010a; van Swaay et al, 2010b; VV.AA, 2009)
<i>Polymixis rufocincta isolata</i>	(noctuid moth)	Y			U1		HU		
<i>Polyommatus eros (Polyommatus eroides)</i>	Eros Blue	Y			U2/XX/XXn	NT	EL, PL, BG, (HU)		
<i>Probaticus subrugosus</i>	(tenebrid beetle)	Y			XX		EL, HU, SK (SI)		(ETC/BD, 2008)
<i>Pseudophilotes bavius</i>	Bavius Blue	Y			XX/XXn	LC	RO, EL	5420 or 5430, 6110 or 6120, 6170	(van Swaay et al, 2010b)
<i>Stenobothrus eurasius*</i>	(grasshopper)	Y			U1/XX	DD	HU, CZ, SK, EL		
<i>Vertigo angustior</i>	Narrow-mouthed Whorl Snail	Y			U2/U1/ FV/XX	VU	AT, BE, CZ, DE, DK, EE, EL, FI, FR, HU, IE, IT, LT, LV, NL, PL, SE, SI, SK, UK	1330, 7230, 7210, 7230 (IE)	(Doody, 2008; INPN, 2011; JNCC, 2007b; Šefferová et al, 2008c)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Vertigo genesii</i>	Round-mouthed Whorl Snail	Y			U2/FV/XX	LC	EE, FI, LV, SE, UK	6170, 7230	(JNCC, 2007b; Pihl et al, 2001)
<i>Vertigo geyeri</i>	Geyer's Whorl Snail	Y			U1/U2	LC	AT, CZ, DE, DK, EE, FI, IE, LT, LV, PL, SE, SI, SK, UK	21A0, 7210, 7230	(JNCC, 2007b; National Parks and Wildlife Service, 2008; Pihl et al, 2001; ŠeffEROVÁ et al, 2008c)
<i>Vertigo moulinsiana</i>	Desmoulin's Whorl Snail	Y			U2/U1/XX/FV	VU	AT, BE, CZ, DE, DK, ES, EL, FR, HU, IE, IT, LT, LV, NL, PL, SE, SK, UK	7230, 7210, 7230 (IE)	(INPN, 2011; JNCC, 2007a; Pihl et al, 2001; ŠeffEROVÁ et al, 2008c)
<b>AMPHIBIANS</b>									
<i>Alytes muletensis</i>	Mallorcan Midwife Toad	Y		Y	U1	VU	ES	8210	(Temple and Cox, 2009a)
<i>Pelobates fuscus insubricus</i>	Common Spadefoot toad - Po Valley subspecies	Y		Y	U2	n/a	IT		(Temple & Cox, 2009a)
<i>Triturus cristatus</i>	Northern/Great Crested Newt	Y		Y	U2/U1	LC	AT, BE, CZ, DE, DK, EE, FI, FR, HU, LT, LV, LU, NL, PL, SE, SK, UK		(Natural England, 2007; Pihl et al, 2001; Temple & Cox, 2009a)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<b>REPTILES</b>									
<i>Hierophis cypriensis</i> ( <i>Coluber cypriensis</i> )	Cyprus Whip Snake	Y		Y	XX	EN	CY		(Temple and Cox, 2009b)
<i>Elaphe quatuorlineata</i> ( <i>Coluber quatuorlineata</i> )	Four-lined Snake	Y			U1	NT	EL, IT, SI		(Temple & Cox, 2009b)
<i>Zamenis situla</i> ( <i>Elaphe situla</i> )	European Ratsnake	Y			XX	LC	EL, IT, MT		(Temple & Cox, 2009b)
<i>Iberolacerta bonnali</i> ( <i>Lacerta bonnali</i> )	Pyrenean Rock Lizard	Y			U2	NT	ES, FR		(Temple & Cox, 2009b)
<i>Lacerta schreiberi</i>	Schreiber's Green Lizard	Y			XX	NT	ES, PT	6310, 4040 etc	(ICNB, 2006; Rödder and Schulte, 2010; Temple & Cox, 2009b)
<i>Macrovipera schweizeri</i>	Cyclades Blunt-nosed Viper	Y		Y	U1	EN	EL		(Temple & Cox, 2009b)
<i>Vipera ursinii</i> (5 subspecies)	Orsini's Viper	Y			U1/U2	VU	EL, FR, IT	5130, 6170	(Orbicon, Écosphère, ATECMA, Ecosystems LTD, 2009; Temple & Cox, 2009b)
<b>MAMMALS</b>									
<i>Bison bonasus</i>	European Bison	Y		Y	U1/U2	VU	PL, SK (LT)	various	(Temple and Terry, 2007)
<i>Capra hircus</i> ( <i>Capra aegragus</i> )*	wild mountain goat	Y			U1	LC	EL, IT	various	(Temple & Terry, 2007)
<i>Capra pyrenaica pyrenaica</i>	Spanish Ibex	Y		Y	U2	EX	ES (extinct)	6160	(ICNB, 2005; Temple & Terry, 2007)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Cervus elaphus corsicanus</i>	Corsican Red Deer	Y		Y	FV	n/a	IT, FR	6220	(European Commission, 2007; San Miguel, 2008)
<i>Marmota marmota latirostris</i>	Tatra Alpine Marmot	Y		Y	U2	n/a	SK, PL (ES)		(Temple & Terry, 2007)
<i>Mesocricetus newtoni</i>	Romanian Hamster	Y			XXn	NT	BG, RO	Mixed farmland	(Temple & Terry, 2007)
<i>Microtus cabrerae</i>	Cabrera's Vole	Y	Y		XX	NT	ES, PT	6420	(Temple & Terry, 2007; VV.AA, 2009)
<i>Microtus oeconomus arenicola</i>	Tundra Vole - Netherlands subspecies	Y		Y	U2	n/a	NL	7210	(Ministerie van Economische Zaken, Landbouw en Innovatie, 2012; Temple & Terry, 2007)
<i>Microtus oeconomus mehelyi</i>	Central European Tundra Vole	Y		Y	U1/U2	n/a	AT, HU, SK	1530	(European Commission, 2007; ŠeffEROVÁ et al, 2008b)
<i>Mustela eversmannii</i>	Steppe Polecat	Y			U2/XX	LC	CZ, HU, PL, SK	1530	(ŠeffEROVÁ et al, 2008b)
<i>Myotis blythii</i>	Lesser Mouse-Eared Myotis bat	Y			U2/U1	NT	AT, CZ, CY, EL, ES, FR, HU, IT, MT, PT, SI, SK	6310, 8310 (SI, FR)	(Temple & Terry, 2007)
<i>Myotis emarginatus</i>	Geoffroy's Myotis bat	Y			U2/U1/ FV/XX	LC	AT, BE, CZ, DE, ES, EL, FR, HU, IT, LU, NL, PL, PT, SI, SK	6310, 8310 (LU, DE)	(Temple & Terry, 2007)

Species (species name if listed differently in Habitats Directive) (*= taxonomy unresolved)	Common name	Grass use	Agri-use	Priority species	Conservation Status	EU-27 red list status	Member States	Typical habitats in which species occurs	References
<i>Ovis aries</i> ( <i>Ovis orientalis ophion</i> )*	wild sheep	Y			U2	LC	CY	6420	(Temple & Terry, 2007)
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe bat	Y	Y		U2/U1/XX	NT	AT, BE, CY, DE, EL, ES, FR, HU, IT, LU, PT, SI, SK, UK (extinct in CZ, NL, PL?)	6310, 8310 (ES, FR, DE)	(Temple & Terry, 2007)
<i>Rupicapra pyrenaica ornata</i> ( <i>Rupicapra rupicapra ornata</i> )	Apennine Chamois	Y		Y	U1	VU	IT	6170 (IT)	(Temple & Terry, 2007)
<i>Rupicapra rupicapra balcanica</i>	Balkan Chamois	Y			U2	n/a	BG, EL (SI)	6170 (EL)	(Temple & Terry, 2007)
<i>Rupicapra rupicapra tatrica</i>	Tatra Chamois	Y		Y	U2	n/a	SK, PL		(Temple & Terry, 2007)
<i>Sicista subtilis</i>	Severtzov's Birch Mouse	Y	Y		XX	NT	HU, PL, SK	1530	(ŠeffEROVÁ et al, 2008b; Temple & Terry, 2007)
<i>Spermophilus citellus</i> ( <i>Citellus citellus</i> )	European Souslik	Y	Y		U2/U1/XXn	VU	AT, CZ, EL, HU, PL, SK, BG, RO	1530, 6250	(European Commission, 2007; ŠeffEROVÁ et al, 2008b; Zingstra et al, 2010)
<i>Spermophilus suslicus</i> ( <i>Citellus suslicus</i> )	Speckled Ground Squirrel, Spotted Souslik	Y	Y	Y	U2	NT	PL		(Temple & Terry, 2007)
<i>Vormela peregusna</i>	European Marbled Polecat	Y			XXn	VU	RO, BG, EL		(Temple & Terry, 2007)

**BIRDS:**

Proportion of population of the species using each agricultural habitat as assessed by Birdlife International (Tucker and Evans, 1997). **2** = >75% of European breeding or wintering population uses the habitat. **1** = 10-75% of European breeding or wintering population uses the habitat. Key: **Moor** = grazed moorland and tundra; **Med** = grazed Mediterranean shrublands; **AIG** = arable and improved grasslands; **SG** = steppe grasslands; **MG** = montane grasslands; **WG** = wet grasslands; **PC** = permanent crops; **PW** = pastoral woodlands.

Priority status = on list of 51 species and subspecies agreed by the Ornithological Committee (which advises the Commission on the implementation of the Directive) that are considered as priority for the purpose of LIFE Nature funding and the development of action plans. These priority species include all globally threatened species that regularly occur in the EU, as well as other some other species that are particularly threatened are a result of their rarity and/or rapidly declining populations.

Dispersed = degree of dispersion in the wider environment (as a measure of the degree to which the species will benefit from measures that are targeted towards Natura sites). **-1** = dispersed species.

EU UFC = latest assessment of conservation status of the whole EU population by Birdlife International (Birdlife International, 2004). **1** = unfavourable status.

Sources:

Birdlife International (2004) Birds in the European Union: a Status Assessment. Birdlife International, Wageningen, Netherlands.

Tucker, G M and Evans, M (1997) Habitats for Birds in Europe: a Conservation Strategy for the Wider Environment. BirdLife International, Cambridge.

Species (*= taxonomy unresolved)	English name	Mo or	Me d	AIG	SG	MG	WG	PC	PW	Priority status	Dispe -rsed	EU UFC	References
<i>Acrocephalus paludicola</i>	Aquatic Warbler						2			1		1	(Flade and Lachmann, 2008; Flor, 2011; Morkvenas, 2012; Prieksa, 2005; Tucker and Evans, 1997; Zadrag et al, 2012)
<i>Aegypius monachus</i>	Cinereous Vulture								1	1		1	(Heredia, 1996a; Tucker & Evans, 1997)
<i>Alectoris barbara</i>	Barbary Partridge		2							0	-1	1	(Tucker & Evans, 1997)
<i>Alectoris graeca</i>	Rock Partridge		1			1				1	-1	1	(Tucker & Evans, 1997)
<i>Anser albifrons flavirostris</i>	Greenland White-fronted Goose			1			1			1		1	(Tucker & Evans, 1997)
<i>Anser erythropus</i>	Lesser White-fronted Goose				2		2			1		1	(Jones et al, 2008; Tucker & Evans, 1997)

Species (*= taxonomy unresolved)	English name	Mo or	Me d	AIG	SG	MG	WG	PC	PW	Priority status	Dispe -rsed	EU UFC	References
<i>Anthus campestris</i>	Tawny Pipit		1		1					0	-1	1	(Delgado and Moreira, 2000; Tucker & Evans, 1997)
<i>Aquila adalberti</i>	Spanish Imperial Eagle		2						2	1		1	(Sánchez et al, 2008; Tucker & Evans, 1997)
<i>Aquila chrysaetos</i>	Golden Eagle		1			1				0		1	(Tucker & Evans, 1997)
<i>Aquila clanga</i>	Greater Spotted Eagle						1			1		1	(Meyburg et al, 1997a; Tucker & Evans, 1997)
<i>Aquila heliaca</i>	Imperial Eagle			1	2					1		1	(Heredia, 1996b; Tucker & Evans, 1997)
<i>Aquila pomarina</i>	Lesser Spotted Eagle			1			1			1	-1	1	(Latvian Fund for Nature, 2008; Meyburg et al, 1997b; Tucker & Evans, 1997)
<i>Asio flammeus</i>	Short-eared Owl	2			1		1			0	-1	1	(Tucker & Evans, 1997)
<i>Branta leucopsis</i>	Barnacle Goose			2						0			(Tucker & Evans, 1997)
<i>Burhinus oedicnemus</i>	Eurasian Thick-knee (Stone Curlew)			1	2					0	-1	1	(Bota et al, 2005; Evans and Green, 2007; Tucker & Evans, 1997)
<i>Buteo rufinus</i>	Long-legged Buzzard		1	1	2					0	-1		(Tucker & Evans, 1997)
<i>Calandrella brachydactyla</i>	Greater Short-toed Lark			2						0	-1	1	(Robledano et al, 2010; Tucker & Evans, 1997)
<i>Chersophilus duponti</i>	Dupont's Lark				2					0		1	(Tucker & Evans, 1997) (Bota et al, 2005; Iñigo et al, 2008b)

Species (*= taxonomy unresolved)	English name	Mo or	Me d	AIG	SG	MG	WG	PC	PW	Priority status	Dispe -rased	EU UFC	References
<i>Chlamydotis undulata</i>	Houbara Bustard				2					1		1	(Tucker & Evans, 1997)
<i>Ciconia ciconia</i>	White Stork			1	1		1		1	0	-1	1	(Delgado & Moreira, 2000; Tucker & Evans, 1997)
<i>Ciconia nigra</i>	Black Stork		1						1	0		1	(Tucker & Evans, 1997)
<i>Circaetus gallicus</i>	Short-toed Snake-eagle		2		1				1	0	-1		(Tucker & Evans, 1997)
<i>Circus cyaneus</i>	Northern Harrier	2		1	1		1			0	-1	1	(Amar et al, 2011; Tucker & Evans, 1997)
<i>Circus macrourus</i>	Pallid Harrier			2						0		1	(Tucker & Evans, 1997)
<i>Circus pygargus</i>	Montagu's Harrier			2	1					0	-1		(Macedo-Sousa et al, 2009; Tucker & Evans, 1997) (Bota et al, 2005)
<i>Coracias garrulus</i>	European Roller		1		1			1	1	0	-1	1	(Tucker & Evans, 1997)
<i>Crex crex</i>	Corncrake			1			1			1	-1	1	(Boatman et al, 2008; Crockford et al, 1997; Latvian Fund for Nature, 2008; Orbicon, Écosphère, ATECMA, Ecosystems LTD, 2009; Tucker & Evans, 1997)
<i>Cygnus bewickii</i> ( <i>C columbianus bewickii</i> )	Tundra Swan / Bewick's Swan / Whistling Swan						1			0		1	(Tucker & Evans, 1997)
<i>Cygnus cygnus</i>	Whooper Swan						1			0			(Tucker & Evans, 1997)

Species (*= taxonomy unresolved)	English name	Mo or	Me d	AIG	SG	MG	WG	PC	PW	Priority status	Dispe -rsed	EU UFC	References
<i>Elanus caeruleus</i>	Black-winged Kite			1					1	0		1	(Tucker & Evans, 1997)
<i>Emberiza cineracea</i>	Cinereous Bunting		2							0	-1	1	(Tucker & Evans, 1997)
<i>Emberiza hortulana</i>	Ortolan Bunting		1	2					1	0	-1	1	(Orbicon, Écosphère, ATECMA, Ecosystems LTD, 2009; Tucker & Evans, 1997)
<i>Falco biarmicus</i>	Lanner Falcon		2		2					1	-1	1	(Gustin et al, 1999; Tucker & Evans, 1997)
<i>Falco cherrug</i>	Saker Falcon			1	2					1		1	(Tucker & Evans, 1997)
<i>Falco naumanni</i>	Lesser Kestrel				2					1		1	(Bota et al, 2005; Catry et al, 2012; Iñigo and Barov, 2011a; Macedo-Sousa et al, 2009; Tucker & Evans, 1997; Ursúa et al, 2005)
<i>Falco vespertinus</i>	Red-footed Falcon			1	1					1	-1	1	(Palatitz et al, 2010; Tucker & Evans, 1997)
<i>Galerida theklae</i>	Thekla Lark		2		1			1	1	0	-1	1	(Tucker & Evans, 1997)
<i>Gallinago media</i>	Great Snipe						2			0		1	(Latvian Fund for Nature, 2008; Tucker & Evans, 1997)
<i>Glareola pratincola</i>	Collared Pratincole			1	1					0	-1	1	(Tucker & Evans, 1997)
<i>Grus grus</i>	Common Crane			1	1		1			0		1	(Tucker & Evans, 1997)
<i>Gypaetus barbatus</i>	Lammergeier					2				1		1	(Fundación para la Conservación del Quebrantahuesos, 2010; Heredia and Heredia, 1997; Tucker & Evans, 1997)

Species (*= taxonomy unresolved)	English name	Mo or	Me d	AIG	SG	MG	WG	PC	PW	Priority status	Dispe -rsed	EU UFC	References
<i>Gyps fulvus</i>	Eurasian Griffon				1	1				0			(Ministry of Agriculture, Natural Resources and Environment, 2011; Tucker & Evans, 1997)
<i>Hieraetus fasciatus</i>	Bonelli's Eagle		2							1		1	(Arroyo and Ferreiro, 1997; Tucker & Evans, 1997)
<i>Hieraetus pennatus</i>	Booted Eagle		2							0	-1	1	(Tucker & Evans, 1997)
<i>Hippolais olivetorum</i>	Olive-tree Warbler		2					1		0	-1	1	(Tucker & Evans, 1997)
<i>Lanius collurio</i>	Red-backed Shrike			2						0	-1	1	(Tucker & Evans, 1997)
<i>Lanius minor</i>	Lesser Grey Shrike			1	1					0	-1	1	(Tucker & Evans, 1997)
<i>Lanius nubicus</i>	Masked Shrike		2					1		0		1	(Tucker & Evans, 1997)
<i>Lullula arborea</i>	Wood Lark		1	1				1	1	0	-1	1	(Tucker & Evans, 1997)
<i>Melanocorypha calandra</i>	Calandra Lark			1	1					0	-1	1	(Delgado & Moreira, 2000; Robledano et al, 2010; Tucker & Evans, 1997)
<i>Milvus milvus</i>	Red Kite		1	1	1				1	0	-1	1	(Knott et al, 2009; Tucker & Evans, 1997)
<i>Milvus migrans</i>	Black Kite			1	1				1	0	-1		(Tucker & Evans, 1997)
<i>Neophron percnopterus</i>	Egyptian Vulture		1		1	1				0		1	(Iñigo et al, 2008a; Tucker & Evans, 1997)
<i>Otis tarda</i>	Great Bustard			1	2					1		1	(Bota et al, 2005; Lemus et al, 2011; Macedo-Sousa et al, 2009; Nagy, 2010; Orbicon, Écosphère, ATECMA, Ecosystems LTD, 2009; Tucker & Evans, 1997)

Species (*= taxonomy unresolved)	English name	Mo or	Me d	AIG	SG	MG	WG	PC	PW	Priority status	Dispe -rased	EU UFC	References
<i>Perdix perdix hispaniensis</i>	Pyrenean Grey Partridge			2	1					0	-1	1	(Tucker & Evans, 1997)
<i>Perdix perdix italica</i>	Italian Grey Partridge			2	1					1	-1	1	(Palumbo and Gallo-Orsi, 1999; Tucker & Evans, 1997)
<i>Pluvialis apricaria</i>	Eurasian Golden-plover	2		1	1					0	-1	1	(Delgado & Moreira, 2000; Tucker & Evans, 1997)
<i>Pterocles alchata</i>	Pin-tailed Sandgrouse			2						0		1	(Tucker & Evans, 1997) (Bota et al, 2005)
<i>Pterocles orientalis</i>	Black-bellied Sandgrouse			2						0		1	(Tucker & Evans, 1997) (Bota et al, 2005)
<i>Pyrhacorax pyrrhacorax</i>	Red-billed Chough		1	1		1				0	-1	1	(Laiolo et al, 2004; Tucker & Evans, 1997)
<i>Tadorna ferruginea</i>	Ruddy Shelduck				1					0		1	(Tucker & Evans, 1997)
<i>Tetrax tetrax</i>	Little Bustard			1	2					1		1	(Barmière et al, 2011; Delgado et al, 2009; Tucker & Evans, 1997) (Bota et al, 2005; Iñigo and Barov, 2011b)

## References

- Amar, A, Davies, J, Meek, E, Williams, J, Knight, A and Redpath, S (2011) Long-term impact of changes in sheep *Ovis aries* densities on the breeding output of the hen harrier *Circus cyaneus*. *Journal of Applied Ecology*, No 48, (1) pp220-227.
- Andras, M and Otto, M (2005) *Pusztai gyalogcincér (Dorcadion fulvum cervae)*. Ministry of Environment and Water Management: Conservation Office, Budapest.
- ANPA (2001) *Liste rosse e blu della flora italiana*. Agenzia Nazionale per la protezione dell'Ambiente.
- AOPK CR (2007) Czech Republic Biomonitoring - Red Book on Habitats and Species of the Czech Republic. Ministerstvo životního prostředí České republiky <http://www.biomonitoring.cz/hp.php>
- Arroyo, B and Ferreiro, E (1997) *European Union Species Action Plan for Bonelli's Eagle (Hieraetus fasciatus)*. European Union, Luxembourg.
- Bacchetta, G, Fenu, G, Mattana, E and Ulian, T (2007) Preliminary results on the conservation of *Lamyropsis microcephala* (Moris) Dittrich & Greuter (Compositae), a threatened endemic species of the Gennargentu massif, Sardinia. *Flora Montiberica*, No 36, pp6-14.
- Baranska, K, Chmielewski, P, Cwener, A, Kiaszewicz, K and Plucinski, P (2009) *Conservation and restoration of xerothermic grasslands in Poland: theory and practice*. Naturalists' Club Publishers, Poland.
- Barmière, L, Havlík, P, Jacquet, F, Lherm, M, Millet, G and Bretagnolle, V (2011) Farming system modelling for agri-environmental policy design: The case of a spatially non-aggregated allocation of conservation measures. *Ecological Economics*, No 70, pp891-899.
- Basnou, C, Pino, J and Smilauer, P (2009) Effect of grazing on grasslands in the Western Romanian Carpathians depends on the bedrock type. *Preslia*, No 81, pp91-104.
- Bensettiti, F, Gaudillat, V, Malengreau, D and Quere, E (2010) *Connaissance et Gestion des Habitats et des Espèces d'Interet Communautaire: Tome 6 Espèces Vegetales*. La Documentation Française, Paris.
- BfN (2011) Fauna-Flora-Habitatrichtlinie Und Vogelschutzrichtlinie - Gebiete Und Arten in Deutschland. Bundesamt fuer Naturschutz <http://www.ffh-gebiete.de/>
- Birdlife International (2011) Review of the Illegal killing and trapping of birds in Europe, in Convention on the Conservation of European Wildlife and Natural Habitats, 6.7.2011, Larnaca, Cyprus. BirdLife International, Cambridge.

Blanca, G, Cabezudo, B, Hernández-Bermejo, J E, Herrera, C M, Muñoz, J and Valdés, B (2000) *Libro Rojo De La Flora Silvestre Amenazada De Andalucía*. Consejería de Medio Ambiente, Junta de Andalucía, Granada.

Blanca, G (2001) *Flora amenazada y endémica de Sierra Nevada*. University of Granada & Consejería de Medio Ambiente, Junta de Andalucía, Granada.

Boatman, N D, Ramwell, C, Parry, H, Jones, N, Bishop, J, Gaskell, P, Short, C, Mills, J and Dwyer, J (2008) *A review of environmental benefits supplied by agri-environment schemes*. A report to the Land Use Policy Group, Central Science Laboratory / Countryside and Community Research Institute, York / Cheltenham.

Bota, G, Morales, M B, Mañosa, S and Camprodon, J (eds) (2005) *Ecology and Conservation of Steppe-Land Birds*. Lynx Edicions & Centre Tecnològic Forestal de Catalunya, Barcelona, Spain.

Butterfly Conservation Europe (2010) *Do's and don'ts for butterflies of the Habitats Directive*. Butterfly Conservation Europe, Wageningen.

Calaciura, B and Spinelli, O (2008) *Management of Natura 2000 Habitats: 6210 \*Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 12/24, European Commission, Brussels.

Catry, I, Amano, T, Franco, A M A and Sutherland, W J (2012) Influence of spatial and temporal dynamics of agricultural practices on the lesser kestrel. *Journal of Applied Ecology*, No 49, (1) pp99-108.

CEEweb (2011) *Military training areas in Natura 2000: Hungary*. CEEweb.

Cerovský, J, Feráková, V, Holub, J, Maglocký, Š and Procházka, F (eds) (1999) *Cervená kniha ohrožených a vzácných druhů Rostlín a Živočichův SR a ČR, Vol. 5: Vyššie Rastliny.*

Cieslak, E and Szlag, Z (2009) Genetic diversity of *Galium cracoviense* ehrend. (Rubiaceae) - the Polish endemic plant. *Acta Societatis Botanicorum Poloniae*, No 78, (2) pp123-129.

Cremene, C 2011. *Effects of grassland management on plants and invertebrates in Transylvania, Romania: A threat to local biodiversity hotspots*. PhD thesis Universitaet Basel.

Crockford, N, Green, R, Rocamora, G, Schäffer, N, Stowe, T and Williams, G (1997) *European Union Species Action Plan for the Corncrake (Crex crex) in Europe*. European Union, Luxembourg.

Delgado, A and Moreira, F (2000) Bird assemblages of an Iberian cereal steppe. *Agriculture Ecosystems and Environment*, No 78, (1) pp65-76.

Delgado, M P, MORALES, M B, Traba, J and Garcia De La Morena, E L (2009) Determining the effects of habitat management and climate on the population trends of a declining steppe bird. *Ibis*, No 151, (3) pp440-451.

Doody, J P (2008) *Management of Natura 2000 Habitats: 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 02/24, European Commission, Brussels.

EEA (2006) *Europe's Biodiversity: The Steppic Region - the plains of Europe*. European Environment Agency, Sweden.

EEA (2008) *Biogeographical Regions in Europe: The Pannonian region - the remains of the Pannonian Sea*. EEA Report No 1/2002. Sweden, European Environment Agency. Europe's Biodiversity - Biogeographical Regions and Seas.

Eriksson, M O G and Rosén, E (2008) *Management of Natura 2000 Habitats: 6280 Nordic alvar and precambrian calcareous flatrocks*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 16/24, European Commission, Brussels.

ETC/BD (2008) *Habitats Directive Article 17 Technical Report (2001-2006)*. European Topic Centre on Biological Diversity <http://bd.eionet.europa.eu/article17>

European Commission (2007) *Interpretation Manual of European Union Habitats - EUR27. Natura 2000*. European Commission, Brussels.

European Commission (2010a) *LIFE+ Nature and Biodiversity: Projects 2009*. Publications Office of the European Union, Luxembourg.

European Commission (2010b) *Action Plan for the Conservation of the Danube Clouded Yellow Colias myrmidone in the European Union*. Species Action Plan. P Marhoul & M Olek (eds), EUSAP, European Commission, Brussels.

Evans, A and Green, R (2007) An example of a two-tiered agri-environment scheme designed to deliver effectively the ecological requirements of both localised and widespread bird species in England. *Journal of Ornithology*, No 148, (0) pp279-286.

Fábián, Z and Iványi, A (2010) *Grasslands in Hungary*. Nimfea Environmental and Nature Conservation Association, Turkeve, Hungary.

Flade, M and Lachmann, L (2008) *International Species Action Plan for the Aquatic Warbler Acrocephalus paludicola*. Landesumweltamt Brandenburg, Eberswalde, Germany.

Flor, I (2011) *Aquatic Warbler project - conserving Acrocephalus paludicola in Poland and Germany*. LIFE 05 NAT/PL/000101, LIFE, Poland.

Fuller, W J, Seffer, J, Cicek, B A, Ozden, O, Eroglu, G, Cara, C and Dogan, O (2010a) *Technical assistance for management and protection of potential Natura 2000 sites in the northern part of Cyprus: Management plan for South Karpaz beaches SEPA*. NIRAS, Nicosia.

Fuller, W J, Seffer, J, Ozden, O, Sefferova, V, Dogan, O, Stritih, J and Kara, C (2011) *Technical assistance for management and protection of potential Natura 2000 sites in the northern part of Cyprus: Management Plan for Alagadi SEPA*. NIRAS, Nicosia.

Fuller, W J, Seffer, J, Cicek, B A, Ozden, O, Eroglu, G, Kara, C, Sefferova, V and Dogan, O (2010b) *Technical assistance for management and protection of potential Natura 2000 sites in the northern part of Cyprus: Management plan for Karpaz SEPA*. NIRAS, Nicosia.

Fundación para la Conservación del Quebrantahuesos (2010) *Pastores de Biodiversidad. Ganadería extensiva y conservación de la biodiversidad en la montaña Cantábrica*. Fundación para la Conservación del Quebrantahuesos, Zaragoza, Spain.

Goliášová, K, Michalková, E and Mráz, P (2008) *Campanula L.*, in K Goliášová & H Šípošová (eds) *Flóra Slovenska VI/I*, VEDA, Bratislava.

Goruip, P (2008) *Natura 2000 in Romania: Species Fact Sheets*. Ministry of Environment and Sustainable Development.

Government of Hungary (1995) *Hungary: country report to the FAO international technical conference on plant genetic resource*. FAO, Budapest.

Gustin, M, Palumbo, G and Corso, A (1999) *European Union Species Action Plan for the Lanner Falcon (Falco biarmicus)*. European Union, Luxembourg.

Hady Land Association (2008) *Restoration of thermophilous habitats in Moravian Karst: Layman's report*. European Commission, Brno.

Heredia, B (1996a) Action plan for the Cinereous Vulture (*Aegypius monachus*) in Europe, in B Heredia, L Rose, & M Painter (eds) *Globally Threatened Birds in Europe: Action Plans*, pp147-158. Council of Europe, and BirdLife International, Strasbourg.

Heredia, B (1996b) Action plan for the Imperial Eagle (*Aquila heliaca*) in Europe, in B Heredia, L Rose, & M Painter (eds) *Globally Threatened Birds in Europe: Action Plans*, pp159-174. Council of Europe, and BirdLife International, Strasbourg.

Heredia, R and Heredia, B (1997) *European Union Species Action Plan for the Lammergeier (Gypaetus barbatus)*. European Union, Luxembourg.

ICNB (2005) *Livro Vermelho dos Vertebrados de Portugal*. Red List of Vertebrates of Portugal. Instituto da Conservação da Natureza e da Biodiversidade, Lisbon, Portugal.

ICNB (2006) *Plano Sectorial da Rede Natura 2000*. Instituto da Conservação da Natureza e da Biodiversidade, Lisbon, Portugal.

ICNB (2008) *Relatório Nacional de Implementação da Directiva Habitats*. Instituto da Conservação da Natureza e da Biodiversidade, Lisbon, Portugal.

ICNB (2009) *Portugal: Fourth National Report to the Convention on Biological Diversity*. Instituto da Conservação da Natureza e da Biodiversidade, Lisbon, Portugal.

Illyés, E and Csatho, G J E A I (2007) Nature conservation actions and strategies for the preservation of rock steppes, loess steppes and wooded steppe meadows, in *Slope Steppes, Loess Steppes and Forest Steppe Meadows in Hungary*, pp214-219.

Iñigo, A and Barov, B (2011a) *European Union Species Action Plan for the Lesser Kestrel (Falco naumanni) in the European Union*. European Union, Luxembourg.

Iñigo, A and Barov, B (2011b) *Species Action Plan for the Little Bustard Tetrax tetrax in the European Union*. SEO/BirdLife and BirdLife International for the European Commission, Luxembourg.

Iñigo, A, Barov, B, Orhun, C and Gallo-Orsi, U (2008a) *Species Action Plan for the Egyptian Vulture (Neophron percnopterus) in the European Union*. European Union, Luxembourg.

Iñigo, A, Graza, V, Tella, J L, Laiolo, P, Suárez, F and Barov, B (2008b) *Action plan for the Dupont's Lark Chersophilus duponti in the European Union*. European Union, Luxembourg.

INPN (2011) Le Portail Du Réseau Natura 2000: Liste Des Habitats Pour Natura 2000 (132 Habitats). Inventaire National du Patrimoine Naturel <http://inpn.mnhn.fr/site/%20natura2000/listeHabitats>

IUCN (2012) IUCN European Red List of Threatened Species. Version 2012.2. <http://www.iucnredlist.org/initiatives/europe>

Ivorra Jiménez, A and García Torres, J M (2011) Joyas Botánicas De Almería. <http://floradealmeria.com/index.html>

JNCC (2007a) *Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006*. Joint Nature Conservation Committee, Peterborough, UK.

JNCC (2007b) UK BAP Priority Species Accounts. Joint Nature Conservation Committee <http://jncc.defra.gov.uk/page-5161>

Jones, T, Martin, K, Barov, B and Nagy, S (2008) *International Single Species Action Plan for the Conservation of the Western Palearctic Population of the Lesser White-fronted Goose Anser erythropus*. 36, AEW Technical Series.

Kaligarić, M, Škornik, S, Ivancić, A, Rebeušek, F, Sternberg, M, Kramberger, B and Sencić, L (2006) Germination and survival of endangered *Pulsatilla grandis* (Ranunculaceae) after artificial seeding, as affected by various disturbances. *Israel Journal of Plant Sciences*, No 54, pp9-17.

Kazakova, Y and Stefanova, V (2010) *High Nature Value Farming in the Western Balkans: Current Status and Key Challenges - a scoping document*. European Forum on Nature Conservation and Pastoralism, Bulgaria.

Knott, J, Newbery, P and Barov, B (2009) *European Union Species Action Plan for the Red Kite (Milvus milvus) in the European Union*. European Union, Luxembourg.

Koval, Š (2011) *Monitoring evropsky významného druhu Notothylas orbicularis (Schwein.) A. Gray. na Šumpersku a Rýmařovsku v roce 2011. Monitoring, zpracování výsledků a fotodokumentace, Biomonitoring Czech Republic, Prague.*

Laiolo, P, Dondero, F, Ciliento, E and Rolando, A (2004) Consequences of pastoral abandonment for the structure and diversity of the alpine avifauna. *Journal of Applied Ecology*, No 41, (2) pp294-304.

Latvian Fund for Nature (2008) Meadows - Restoration of Latvian Floodplains for EU Priority Species and Habitats (LIFE Project). Latvijas Dabas Fonds [http://www.ldf.lv/pub/?doc\\_id=28143](http://www.ldf.lv/pub/?doc_id=28143)

Lemus, J A, Bravo, C, García-Montijano, M, Palacín, C, Ponce, C, Magaña, M and Alonso, J C (2011) Side effects of rodent control on non-target species: Rodenticides increase parasite and pathogen burden in great bustards. *Science of the Total Environment*, No 409, (22) pp4729-4734.

Lozano, F D, Herbada, D G, Rivero, L M, Saiz, J C M and Ollero, H S (1996) Threatened plants in peninsular and balearic Spain: a report based on the EU habitats directive. *Biological Conservation*, No 76, pp122-133.

Macedo-Sousa, J A, Soares, A M V M and Tarazona, J V (2009) A conceptual model for assessing risks in a Mediterranean Natura 2000 Network site. *Science of the Total Environment*, No 407, (3) pp1224-1231.

McCorry, M and Ryle, T (2009) *Saltmarsh monitoring project 2007-2008: final report. A report for Research Branch, National Parks and Wildlife Service, National Parks and Wildlife Service, Ireland.*

Meyburg, B-U, Haraszthy, L, Strazds, M and Schäffer, N (1997a) *European Species Action Plan for Greater Spotted Eagle (Aquila clanga).*

Meyburg, B-U, Haraszthy, L, Strazds, M and Schäffer, N (1997b) *European Union Species Action Plan for Lesser Spotted Eagle (Aquila pomarina).*

Mihut, S and Dinca, V (2006) *Preinventory for a draft list of Natura 2000 sites (SCIs) for Lepidoptera species in Romania: Final Report.* Focal Centre for Biodiversity Monitoring and Conservation, Romania.

Ministerie van Economische Zaken, Landbouw en Innovatie (2012) Natura 2000 in the Netherlands: Habitat Types and Species. Ministerie van Economische Zaken, Landbouw en Innovatie <http://www.synbiosys.alterra.nl/natura2000/default.aspx?main=home>

Ministerio de Medio Ambiente y Medio Rural y Marino (2011a) *Catalogo Nacional De Especies Amenazadas: Listado De Especies De Flora En Peligro De Extinction.* Ministerio de Medio Ambiente y Medio Rural y Marino, Gobierno de España [http://www.marm.es/es/biodiversidad/temas/conservacion-de-especies-amenazadas/catalogo-nacional-de-especies-amenazadas/peligro\\_extincion.aspx](http://www.marm.es/es/biodiversidad/temas/conservacion-de-especies-amenazadas/catalogo-nacional-de-especies-amenazadas/peligro_extincion.aspx)

Ministerio de Medio Ambiente y Medio Rural y Marino (2011b) *Catálogo Nacional De Especies Amenazadas: Listado De Especies De Flora De Interés Especial*. Ministerio de Medio Ambiente y Medio Rural y Marino, Gobierno de España [http://www.marm.es/es/biodiversidad/temas/conservacion-de-especies-amenazadas/catalogo-nacional-de-especies-amenazadas/interes\\_especial.aspx](http://www.marm.es/es/biodiversidad/temas/conservacion-de-especies-amenazadas/catalogo-nacional-de-especies-amenazadas/interes_especial.aspx)

Ministerio de Medio Ambiente y Medio Rural y Marino (2011c) *Catálogo Nacional De Especies Amenazadas: Listado De Especies De Flora Vulnerables*. Ministerio de Medio Ambiente y Medio Rural y Marino, Gobierno de España <http://www.marm.es/es/biodiversidad/temas/conservacion-de-especies-amenazadas/catalogo-nacional-de-especies-amenazadas/vulnerables.aspx>

Ministry of Agriculture, Natural Resources and Environment (2011) *2010 Annual Report of the Department of Forests of Republic of Cyprus*. (english summary). Ministry of Agriculture, Natural Resources and Environment, Nicosia.

Ministry of the Environment of the Slovak Republic (1998) *National report on status and conservation of biological diversity in Slovakia*. Ministry of the Environment of the Slovak Republic, Slovakia.

Morkvenas, Z (2012) Aquatic Warbler in Lithuania and Latvia (*Acrocephalus Paludicola*). <http://www.meldine.lt/en>

Nagy, S (2010) *International single species action plan for the Western Palearctic population of Great Bustard, Otis tarda tarda*. SEO/BirdLife and BirdLife International for the European Commission, Luxembourg.

National Parks and Wildlife Service (2008) *The status of EU protected habitats and species in Ireland*. National Parks and Wildlife Service, Dublin, Ireland.

Natural England (2007) Advice for land managers. European protected species: What you need to know about great crested newts. Natural England. Environmental Stewardship Information Series.

Observatoire de la Faune, de la Flore et des Habitats (2011) *Système D'Informations Sur La Biodiversité En Wallonie: Documents Disponibles Concernant Le Réseau Natura2000*. Division de la Nature et des Forêts, Wallonie, Belge <http://old.biodiversite.wallonie.be/sites/Natura2000/>

Orbicon, Écosphère, ATECMA, Ecosystems LTD (2009) *How species conservation can be supported through rural development programmes: Good practice examples*. Wildlife and sustainable farming and the Birds and Habitats Directives. Orbicon, Ecosphere, ATECMA, & Ecosystems LTD (eds), Wildlife and Sustainable Farming Initiative, Brussels.

Palatitz, P, Fehérvári, P, Solt, S and Barov, B (2010) *European Union Species Action Plan for the Red-footed Falcon (Falco vespertinus)*. European Union, Luxembourg.

Palumbo, G and Gallo-Orsi, U (1999) *Management statement for the Italian Grey Partridge *Perdix perdix italica**. SEO/BirdLife and BirdLife International for the European Commission, Luxembourg.

Pihl, S, Ejrnaes, R, Søgaaard, B, Nielsen, K E, Dahl, K and Laursen, J S (2001) *Habitats and species covered by the EEC Habitats directive: a preliminary assessment of distribution and conservation status in Denmark*. NERI Technical Report No 365, Ministry of Environment and Energy, National Environmental Research Institute, Denmark.

Polák, P and Saxa, A (eds) (2005) *Priaznivý Stav Biotopov a Druhov Európskeho Významu (Slovak Manual of Habitats of European Importance)*. SOP SR, Banská Bystrica, Slovakia.

Prieksa, Z (2005) Aquatic Warbler *Acrocephalus Paludicola* Conservation Status in Lithuania. Lithuanian Ornithological Society Presentation slides [http://www.aquaticwarbler.net/download/Pub\\_conferences/2005\\_Palencia\\_LIFE\\_Conf/Prieksa\\_AW\\_conservation\\_in\\_Lithuania.pdf](http://www.aquaticwarbler.net/download/Pub_conferences/2005_Palencia_LIFE_Conf/Prieksa_AW_conservation_in_Lithuania.pdf)

Regione Siciliana (2011) *Piano di gestione dell'ambito territoriale "Zona Montana Costiera del Palermitano"*. Regione Siciliana.

Robledano, F, Esteve, M A, Farinós, P, Carreño, M F and Martínez-Fernández, J (2010) Terrestrial birds as indicators of agricultural-induced changes and associated loss in conservation value of Mediterranean wetlands. *Ecological Indicators*, No 10, (2) pp274-286.

Rödder, D and Schulte, U (2010) Potential loss of genetic variability despite well established network of reserves: the case of the Iberian endemic lizard *Lacerta schreiberi*. *Biodiversity and Conservation*, No 19, (9) pp2651-2666.

Ronningen, K, Flo, B E, Olsson, G A, Hanssen, S K and Wehn, S (2005) *Sustainability Assessment of Agro-Ecosystems and Rural Development in Mountain Areas: Scenarios for Eastern Jotunheimen, Norway*. BioScene - Scenarios for Reconciling Biodiversity Conservation with Declining Agriculture Use in Mountain Areas in Europe (2002-2005). Centre for Rural Research, Trondheim.

Rybka, V, Rybková, R and Pohlová, R (2005) *Plants of the Natura 2000 network in the Czech Republic*. Olomouc, Praha.

San Miguel, A (2008) *Management of Natura 2000 Habitats: 6220 Pseudo-steppe with grasses and annuals (Thero-Brachypodietea)*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 13/24, European Commission, Brussels.

Sánchez, B, González, L and Barov, B (2008) *Action plan for the Spanish Imperial Eagle *Aquila adalberti* in the European Union*.

Sarbu, A (2004) *Important Plant Area Project - Romania*. University of Bucharest, Bucharest.

Sarbu, A, Gheorghe, C, Gavril, N, Vasile, C, Hanganu, J and Veen, P (2004) *Grasslands of Romania*. Final report on National Grasslands Inventory 2000-2003. University of Bucharest, Bucharest, Romania.

Šeffer, J, Rastislav, L, Galvánek, D and Stanová, V (2002) *Grasslands of Slovakia: final report on National Grassland Inventory 1998 - 2002*. DAPHNE Institute of Applied Ecology, Bratislava.

Šefferová, S V, Vajda, Z and Janák, M (2008a) *Management of Natura 2000 Habitats: 6260 \*Pannonic sand steppes*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 15/24, European Commission, Brussels.

Šefferová, S V, Janák, M and Ripka, J (2008b) *Management of Natura 2000 Habitats: 1530 \*Pannonic salt steppes and salt marshes*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 03/24, European Commission, Brussels.

Šefferová, S V, Šeffer, J and Janák, M (2008c) *Management of Natura 2000 Habitats: 7230 Alkaline fens*. Technical Report 2008 20/24, European Commission, Brussels.

Skálová, H, Krahulec, F, Hadincová, V, Freiová, R, Herben, T and Pechácková, S (1999) Meadows in the Krkonoše Mountains: what we know about their variability and management, in *Changing Agriculture and Landscape: Ecology, Management and Biodiversity Decline in Anthropogenous Mountain Grassland*, pp43-48. EUROMAB Symposium, 15.9.1999, Gumpenstein, Vienna

SLU (2011) ArtDatabanken: Swedish Species Information Centre. Sveriges lantbruksuniversitet <http://www.artfakta.se/GetSpecies.aspx?SearchType=Advanced>

Sundseth, K (2009a) *Natura 2000 in the Alpine Region*. European Commission, Brussels.

Sundseth, K (2009b) *Natura 2000 in the Steppic region*. European Communities, Brussels.

Šuvada, R (2011) *Program záchrany kriticky ohrozeného druhu vèelník rakúsky (Dracocephalum austriacum L.)*. State Nature Conservancy of Slovakia, Banská Bystrica.

Swedish Environmental Protection Agency (2003) *Natura 2000 monitoring in Sweden*. Appendix 2. Swedish Environmental Protection Agency, Stockholm.

Temple, H J and Terry, A (2007) *The Status and Distribution of European Mammals*. Office for Official Publications of the European Communities, Luxembourg.

Temple, H J and Cox, N A (2009a) *European Red List of Amphibians*. Office for Official Publications of the European Communities, Luxembourg.

Temple, H J and Cox, N A (2009b) *European Red List of Reptiles*. Office for Official Publications of the European Communities, Luxembourg.

Tucker, G M and Evans, M (1997) *Habitats for Birds in Europe: a Conservation Strategy for the Wider Environment*. BirdLife International, Cambridge.

Turis, P and Galvnek, D (2003) cinnost vybranch zsahov na populciu poniklecov v Prrodnej rezervcii Mackov Bok. *Nature Conservation*, No 22, pp13-22.

Ursa, E, Serrano, D and Tella, J L (2005) Does land irrigation actually reduce foraging habitat for breeding lesser kestrels? The role of crop types. *Biological Conservation*, No 122, (4) pp643-648.

van Swaay, C A M, Collins, S, Dusej, G, Maes, D, Munguira, M L, Rakosy, L, Ryrholm, N, ašid, M, Settele, J, Thomas, J, Verovnik, R, Verstrael, T, Warren, M S, Wiemers, M and Wynhoff, I (2010a) *Do's and don'ts for butterflies of the Habitats Directive*. Version 2 January 2011. Report VS2010.037, Butterfly Conservation Europe & De Vlinderstichting, Wageningen.

van Swaay, C, Warren, M and Lois, G (2006) Biotope use and trends of European butterflies. *Journal of Insect Conservation*, No 10, (2) pp189-209.

van Swaay, C, Cuttelod, A, Collins, S, Maes, D, Munguira, M L, ašic, M, Settele, J, Vervovnik, R, Verstrael, T, Warren, M, Wiemers, M and Wynhoff, I (2010b) *European Red List of Butterflies*. Publications Office of the European Union, Luxembourg.

Various (2010) Succession, Management and Restoration of Dry Grasslands, in M Janiřov, M Budzakova, & M Petrasova (eds) 7th European Dry Grassland Meeting, 27.5.2010, Smolenice Congress Centre, Slovak Republic

VV.AA (2009) Bases Ecolgicas Preliminares Para La Conservacin De Los Tipos De Hbitat De Inters Comunitario En Espaa. Ministerio de Medio Ambiente, y Medio Rural y Marino online resource [http://www.magrama.gob.es/es/biodiversidad/temas/red-natura-2000/documentos-claves-de-la-red-natura-2000/acceso\\_fichas2010-10-28\\_21.04.13.6872.aspx](http://www.magrama.gob.es/es/biodiversidad/temas/red-natura-2000/documentos-claves-de-la-red-natura-2000/acceso_fichas2010-10-28_21.04.13.6872.aspx)

Wehn, S 2008. *Vegetation dynamics in semi-natural cultural landscapes - consequences of changed agricultural practices in Eastern Jotunheimen - Norway*. Norwegian University of Science and Technology.

WWF (2008) *High Nature Value farmlands: recognising the importance of South East European landscapes*. Case study report Mehedinti (Romania). WWF Danube-Carpathian Programme and European Forum on Nature Conservation and Pastoralism, Sweden.

Zadrag, M, Szalanski, P and Lachmann, L (2012) *Conserving Aquatic Warblers in Poland and Germany*. Achievements of the Aquatic Warbler LIFE Project. The Polish Society for the Protection of Birds, Poland.

Zimmermann, K, Blazkova, P, Cizek, O, Fric, Z, Hula, V, Kepka, P, Novotny, D, Slamova, I and Konvicka, M (2011) Demography of adults of the Marsh fritillary butterfly, *Euphydryas aurinia* (Lepidoptera: Nymphalidae) in the Czech Republic: Patterns across sites and seasons. *European Journal of Entomology*, No 108, (2) pp243-254.

Zingstra, H, Swart, W and Grigorova, Y (2010) *Model for Calculating Agri-environment Payments in Natura 2000 Sites*. Centre for Development Innovation, Wageningen.

## Annex C - Main habitats of Community interest dependent on agriculture in each Member State

**This table shows** the area of agricultural habitats of Community importance in those Member States that contain 10% or more of the total area of a habitat within any given biogeographical region. This highlights to Member States the habitats for which they have an important responsibility.

### Key/Sources

% of total per BGR = proportion of total area of a habitat within any given biogeographical region. Only habitats that are present as 10% or more of the total area of a habitat within any given biogeographical region are included in the table. ALP = Alpine, ATL = Atlantic, BLS = Black Sea, BOR = Boreal, CON = Continental, MAC = Macaronesian, MED = Mediterranean, PAN = Pannonic, STP = Steppic

Status = conservation status reported under Article 17 in 2007. FV = favourable, U1 = unfavourable, U2 = unfavourable-bad, + = improving trend, - = deteriorating trend.

The information comes from the Article 17 database. The habitats in Romania and Bulgaria are listed according to the habitats check list, but no area or status data are available.

EEA (2008) Habitats Directive Article 17 database. <http://www.eea.europa.eu/data-and-maps/data/article-17-database-habitats-directive-92-43-eeec>

ETC/BD (2012) Habitats check list. [http://bd.eionet.europa.eu/article17/reference\\_portal](http://bd.eionet.europa.eu/article17/reference_portal)

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
AT	CON	1530	Pannonic salt steppes and salt marshes	100%	1,500	U2
AT	CON	2340	Pannonic inland dunes	100%	8	U2+
AT	ALP	4060	Alpine and Boreal heaths	20%	604,200	FV
AT	ALP	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	60%	20,500	U2
AT	CON	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	14%	9,900	U2
AT	ALP	6110	Rupicolous calcareous or basophilic grasslands of the Alyso-Sedion albi	43%	5,000	U1
AT	CON	6110	Rupicolous calcareous or basophilic grasslands of the Alyso-Sedion albi	23%	1,800	U1

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
AT	ALP	6150	Siliceous alpine and boreal grasslands	48%	370,000	FV
AT	ALP	6170	Alpine and subalpine calcareous grasslands	32%	200,000	U1
AT	ALP	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	11%	20,000	U1
AT	ALP	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	55%	133,400	U1
AT	CON	6240	Sub-pannonic steppic grassland	77%	3,500	U1
AT	CON	6250	Pannonic loess steppic grasslands	100%	20	U2+
AT	CON	6260	Pannonic sand steppes	100%	150	U2+
AT	ALP	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	14%	3,000	U1
AT	CON	6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	10%	900	U2
AT	ALP	8240	Limestone pavements	63%	30,000	FV
BE	ATL	2310	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>	15%	2,000	U2
BE	ATL	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	11%	1,280	U2
BE	CON	4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	41%	2,000	U2
BE	ATL	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	11%	4,900	U2
BE	ATL	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	13%	7,400	U2
BG	CON	1530	Pannonic salt steppes and salt marshes	N/A	N/A	N/A
BG	BLS	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	N/A	N/A	N/A
BG	CON	2340	Pannonic inland dunes	N/A	N/A	N/A
BG	ALP	4060	Alpine and Boreal heaths	N/A	N/A	N/A

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
BG	CON	4060	Alpine and Boreal heaths	N/A	N/A	N/A
BG	ALP	4090	Endemic oro-Mediterranean heaths with gorse	N/A	N/A	N/A
BG	BLS	4090	Endemic oro-Mediterranean heaths with gorse	N/A	N/A	N/A
BG	CON	4090	Endemic oro-Mediterranean heaths with gorse	N/A	N/A	N/A
BG	ALP	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	N/A	N/A	N/A
BG	CON	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	N/A	N/A	N/A
BG	ALP	5210	Arborescent matorral with <i>Juniperus</i> spp.	N/A	N/A	N/A
BG	BLS	5210	Arborescent matorral with <i>Juniperus</i> spp.	N/A	N/A	N/A
BG	CON	5210	Arborescent matorral with <i>Juniperus</i> spp.	N/A	N/A	N/A
BG	ALP	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	N/A	N/A	N/A
BG	BLS	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	N/A	N/A	N/A
BG	CON	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	N/A	N/A	N/A
BG	CON	6170	Alpine and subalpine calcareous grasslands	N/A	N/A	N/A
BG	ALP	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	N/A	N/A	N/A
BG	BLS	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	N/A	N/A	N/A
BG	CON	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	N/A	N/A	N/A
BG	ALP	6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	N/A	N/A	N/A
BG	BLS	6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	N/A	N/A	N/A
BG	CON	6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	N/A	N/A	N/A
BG	ALP	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas,	N/A	N/A	N/A

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
			in continental Europe)			
BG	CON	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	N/A	N/A	N/A
BG	ALP	6240	Sub-pannonic steppic grassland	N/A	N/A	N/A
BG	BLS	6240	Sub-pannonic steppic grassland	N/A	N/A	N/A
BG	CON	6240	Sub-pannonic steppic grassland	N/A	N/A	N/A
BG	CON	6250	Pannonic loess steppic grasslands	N/A	N/A	N/A
BG	ALP	62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	N/A	N/A	N/A
BG	BLS	62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	N/A	N/A	N/A
BG	CON	62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	N/A	N/A	N/A
BG	ALP	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	N/A	N/A	N/A
BG	CON	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	N/A	N/A	N/A
BG	ALP	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	N/A	N/A	N/A
BG	BLS	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	N/A	N/A	N/A
BG	CON	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	N/A	N/A	N/A
BG	ALP	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	N/A	N/A	N/A
BG	BLS	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	N/A	N/A	N/A
BG	CON	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	N/A	N/A	N/A
BG	ALP	6520	Mountain hay meadows	N/A	N/A	N/A
BG	CON	6520	Mountain hay meadows	N/A	N/A	N/A

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
BG	ALP	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	N/A	N/A	N/A
BG	BLS	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	N/A	N/A	N/A
BG	CON	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	N/A	N/A	N/A
CZ	PAN	1340	Inland salt meadows	10%	29	U2
CZ	PAN	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	100%	100	U2
CZ	CON	6150	Siliceous alpine and boreal grasslands	97%	1,100	FV
CZ	CON	6190	Rupicolous pannonic grasslands ( <i>Stipo-Festucetalia pallentis</i> )	100%	400	U1
CZ	CON	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	35%	18,400	U2
CZ	CON	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	17%	8,600	U2
CZ	CON	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	25%	17,100	U2
CZ	CON	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	18%	203,000	U2
CZ	CON	6520	Mountain hay meadows	12%	19,800	U2
CZ	PAN	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	26%	23	FV
DE	ATL	1330	Atlantic salt meadows	19%	150,038	U1
DE	ATL	1340	Inland salt meadows	99%	39	U2
DE	CON	1340	Inland salt meadows	25%	637	U1
DE	ATL	2150	Atlantic decalcified fixed dunes ( <i>Calluno-Uliceteta</i> )	17%	247	U2

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
DE	CON	2150	Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> )	100%	135	U2
DE	ATL	2310	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>	14%	1,862	U2
DE	CON	2310	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>	87%	3,240	U1
DE	ATL	2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	27%	510	U2
DE	ATL	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	11%	1,285	U1
DE	CON	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	44%	7,751	U1
DE	CON	4030	European dry heaths	34%	33,538	U2
DE	CON	6120	Xeric sand calcareous grasslands	42%	3,948	U1
DE	CON	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> )	17%	35,962	U1
DE	CON	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	19%	9,731	U1
DE	ATL	6240	Sub-pannonic steppic grassland	100%	16	U1
DE	CON	6240	Sub-pannonic steppic grassland	18%	800	U1
DE	CON	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	20%	10,016	U2
DE	ATL	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	25%	11,400	U1
DE	CON	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	35%	23,400	FV
DE	ATL	6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	100%	14	U2
DE	CON	6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	52%	4,442	U2
DE	ATL	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	12%	6,963	U2
DE	CON	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	13%	146,004	U1

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
DE	CON	6520	Mountain hay meadows	13%	20,835	U1
DE	CON	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	22%	1,569	U1
DE	CON	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	15%	845	FV
DK	ATL	1330	Atlantic salt meadows	14%	13,900	U2
DK	CON	1330	Atlantic salt meadows	22%	21,800	U2
DK	CON	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	42%	6,100	U2
DK	ATL	2140	Decalcified fixed dunes with <i>Empetrum nigrum</i>	81%	13,800	U1
DK	CON	2140	Decalcified fixed dunes with <i>Empetrum nigrum</i>	93%	5,000	U1
DK	ATL	2190	Humid dune slacks	27%	3,600	U1
DK	CON	2190	Humid dune slacks	71%	2,200	U2
DK	CON	2250	Coastal dunes with <i>Juniperus</i> spp.	43%	300	U1
DK	ATL	2310	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>	13%	1,750	U2
DK	CON	2310	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>	13%	500	U2
DK	ATL	2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	21%	400	U2
DK	CON	2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	67%	1,000	U2
DK	CON	4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	31%	1,500	U2
DK	ATL	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	12%	2,100	U2
DK	CON	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	15%	8,100	U2

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
EE	BOR	1630	Boreal Baltic coastal meadows	56%	12,000	U1-
EE	BOR	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	13%	550	FV
EE	BOR	2140	Decalcified fixed dunes with <i>Empetrum nigrum</i>	13%	40	XX
EE	BOR	2190	Humid dune slacks	45%	330	FV
EE	BOR	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	11%	300	U1
EE	BOR	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	53%	5,300	FV
EE	BOR	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	22%	5,000	U1-
EE	BOR	6270	Fennoscandian lowland species-rich dry to mesic grasslands	13%	5,200	U1-
EE	BOR	6280	Nordic alvar and precambrian calcareous flatrocks	54%	10,000	U1-
EE	BOR	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	14%	3,500	FV
EE	BOR	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	15%	2,000	FV
EE	BOR	6450	Northern boreal alluvial meadows	44%	19,000	U1-
EE	BOR	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	17%	3,300	FV
EE	BOR	6530	Fennoscandian wooded meadows	70%	3,700	U1
EE	BOR	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	32%	3,600	U2-
EE	BOR	7230	Alkaline fens	15%	23,900	U2
EE	BOR	8240	Limestone pavements	26%	200	U1
EE	BOR	9070	Fennoscandian wooded pastures	14%	3,300	U1
EL	MED	4060	Alpine and Boreal heaths	12%	15,708	FV
EL	MED	5420	<i>Sarcopoterium spinosum</i> phryganas	93%	235,800	FV

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
EL	MED	5430	Endemic phrygas of the Euphorbio-Verbascion	56%	25,430	FV
EL	MED	6170	Alpine and subalpine calcareous grasslands	10%	36,200	FV
EL	MED	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	38%	14,180	FV
EL	MED	62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	100%	22,710	U1
ES	MAC	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	98%	4,000	U1
ES	MED	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	100%	646	XX
ES	MED	2150	Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> )	100%	4,030	XX
ES	MED	2250	Coastal dunes with <i>Juniperus</i> spp.	25%	4,398	XX
ES	MED	4020	Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>	100%	127,800	XX
ES	ALP	4030	European dry heaths	32%	5,109	U1
ES	ATL	4030	European dry heaths	35%	753,571	XX
ES	MED	4030	European dry heaths	97%	602,500	XX
ES	ATL	4060	Alpine and Boreal heaths	39%	35,779	XX
ES	MED	4060	Alpine and Boreal heaths	81%	104,900	XX
ES	ALP	4090	Endemic oro-Mediterranean heaths with gorse	85%	20,879	XX
ES	ATL	4090	Endemic oro-Mediterranean heaths with gorse	100%	340,200	XX
ES	MAC	4090	Endemic oro-Mediterranean heaths with gorse	100%	29,000	U1
ES	MED	4090	Endemic oro-Mediterranean heaths with gorse	91%	1,793,500	XX
ES	ALP	5120	Mountain <i>Cytisus purgans</i> formations	69%	22,708	XX

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
ES	ATL	5120	Mountain <i>Cytisus purgans</i> formations	100%	11,900	XX
ES	MED	5120	Mountain <i>Cytisus purgans</i> formations	96%	279,900	XX
ES	ALP	5210	Arborescent matorral with <i>Juniperus</i> spp.	22%	1,499	XX
ES	MED	5210	Arborescent matorral with <i>Juniperus</i> spp.	87%	849,700	XX
ES	MAC	5330	Thermo-Mediterranean and pre-desert scrub	94%	166,000	U1
ES	MED	5330	Thermo-Mediterranean and pre-desert scrub	90%	929,955	XX
ES	MED	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	91%	110,870	XX
ES	ALP	6140	Siliceous Pyrenean <i>Festuca eskia</i> grasslands	72%	59,007	U2+
ES	ATL	6140	Siliceous Pyrenean <i>Festuca eskia</i> grasslands	100%	10,578	XX
ES	ATL	6160	Oro-Iberian <i>Festuca indigesta</i> grasslands	100%	198,500	XX
ES	MED	6160	Oro-Iberian <i>Festuca indigesta</i> grasslands	100%	219,069	XX
ES	MED	6170	Alpine and subalpine calcareous grasslands	76%	270,770	XX
ES	ALP	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	29%	54,135	XX
ES	ATL	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	41%	94,035	XX
ES	MED	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	22%	57,744	XX
ES	MED	6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	82%	1,195,339	XX
ES	MED	6310	Dehesas with evergreen <i>Quercus</i> spp.	98%	1,531,620	XX
ES	MED	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	60%	5,172	XX
ES	MAC	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	100%	5	U2
ES	MED	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	95%	233,726	XX

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
ES	MED	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	79%	42,019	XX
ES	ALP	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	19%	30,875	XX
ES	MED	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	65%	57,761	XX
ES	MED	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	22%	600	XX
ES	MED	7230	Alkaline fens	23%	800	XX
ES	MED	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	99%	226,400	XX
FI	BOR	1630	Boreal Baltic coastal meadows	20%	4,200	U2
FI	BOR	2140	Decalcified fixed dunes with <i>Empetrum nigrum</i>	33%	100	U1
FI	BOR	2190	Humid dune slacks	14%	100	U1
FI	BOR	4030	European dry heaths	10%	1,000	U2-
FI	ALP	4060	Alpine and Boreal heaths	18%	560,000	U1-
FI	BOR	4060	Alpine and Boreal heaths	100%	110,000	U1-
FI	BOR	6150	Siliceous alpine and boreal grasslands	60%	300	FV
FI	BOR	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	31%	4,000	U1
FI	BOR	6520	Mountain hay meadows	52%	150	U2-
FI	ALP	7230	Alkaline fens	24%	9,800	FV
FI	BOR	7230	Alkaline fens	37%	60,000	U1-
FI	BOR	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	75%	15,000	FV

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
FI	BOR	9070	Fennoscandian wooded pastures	13%	3,000	U2
FR	ATL	1330	Atlantic salt meadows	26%	26,400	U1
FR	CON	1340	Inland salt meadows	24%	600	U2
FR	ATL	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	20%	12,400	U2
FR	ATL	2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	14%	200	U2
FR	ATL	2190	Humid dune slacks	45%	6,100	U2
FR	MED	2190	Humid dune slacks	44%	1,125	XX
FR	MED	2250	Coastal dunes with <i>Juniperus</i> spp.	13%	2,200	U1
FR	ATL	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	61%	6,800	U2
FR	MED	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	100%	200	XX
FR	CON	4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	12%	600	U2
FR	ALP	4020	Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>	100%	2,200	U2
FR	ATL	4020	Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>	98%	22,200	U2
FR	CON	4020	Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>	100%	200	U1
FR	ALP	4030	European dry heaths	66%	10,400	U1
FR	CON	4030	European dry heaths	22%	21,700	U2
FR	ATL	4040	Dry Atlantic coastal heaths with <i>Erica vagans</i>	63%	1,000	U1
FR	CON	4060	Alpine and Boreal heaths	21%	1,500	U1
FR	ALP	4090	Endemic oro-Mediterranean heaths with gorse	14%	3,400	U1
FR	ALP	5120	Mountain <i>Cytisus purgans</i> formations	31%	10,100	FV

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
FR	CON	5120	Mountain <i>Cytisus purgans</i> formations	100%	3,800	FV
FR	ALP	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	18%	6,100	FV
FR	ATL	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	90%	12,200	U1
FR	CON	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	10%	7,100	U2
FR	MED	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	43%	6,000	U1
FR	ALP	5210	Arborescent matorral with <i>Juniperus</i> spp.	43%	3,000	FV
FR	ALP	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	38%	4,400	U1
FR	ATL	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	100%	1,800	U1
FR	CON	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	24%	1,900	U1
FR	ATL	6120	Xeric sand calcareous grasslands	97%	4,600	U2
FR	MED	6120	Xeric sand calcareous grasslands	100%	200	XX
FR	ALP	6140	Siliceous Pyrenean <i>Festuca eskia</i> grasslands	28%	22,500	FV
FR	ALP	6170	Alpine and subalpine calcareous grasslands	12%	77,200	FV
FR	CON	6170	Alpine and subalpine calcareous grasslands	32%	4,900	U1
FR	ALP	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	16%	28,900	U1
FR	ATL	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	14%	32,300	U2
FR	CON	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	16%	33,500	U2
FR	MED	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	16%	40,200	U1
FR	ATL	6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	100%	700	XX
FR	ATL	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas,	47%	8,400	U2

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
			in continental Europe)			
FR	CON	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	15%	7,800	U2
FR	MED	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	19%	7,100	U1
FR	ALP	6240	Sub-pannonic steppic grassland	63%	1,400	U1
FR	ALP	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	24%	5,200	U1
FR	ATL	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	33%	12,900	U2
FR	CON	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	24%	12,300	U2
FR	MED	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	35%	3,000	U1
FR	ATL	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	100%	30	U2
FR	ALP	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	18%	9,800	FV
FR	ATL	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	61%	27,500	U2
FR	CON	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	15%	10,200	U1
FR	MED	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	11%	5,900	U1
FR	ATL	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	72%	41,800	U2
FR	MED	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	24%	21,500	U2
FR	ALP	6520	Mountain hay meadows	25%	13,600	U2
FR	MED	6520	Mountain hay meadows	100%	5,000	U2
FR	ALP	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	83%	1,100	U1

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
FR	ATL	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	83%	10,300	U1
FR	CON	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	37%	2,600	U1
FR	MED	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	48%	1,300	U1
FR	ALP	7230	Alkaline fens	19%	7,600	U1
FR	ATL	7230	Alkaline fens	54%	8,900	U2
FR	CON	7230	Alkaline fens	98%	755,600	U2
FR	ALP	7230	Alkaline fens	52%	1,800	U2
FR	ALP	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	18%	3,600	U1
FR	ATL	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	99%	3,300	U1
FR	CON	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	37%	2,100	FV
FR	CON	8240	Limestone pavements	99%	54,000	XX
FR	MED	8240	Limestone pavements	18%	800	FV
HU	PAN	1530	Pannonic salt steppes and salt marshes	100%	200,000	U2
HU	PAN	2340	Pannonic inland dunes	42%	500	U2
HU	PAN	4030	European dry heaths	11%	700	U2
HU	PAN	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	92%	1,500	U1
HU	PAN	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	79%	50	XX
HU	PAN	6190	Rupicolous pannonic grasslands ( <i>Stipo-Festucetalia pallentis</i> )	93%	1,200	U1

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
HU	PAN	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	60%	8,000	U2
HU	PAN	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	100%	50	U2
HU	PAN	6240	Sub-pannonic steppic grassland	94%	19,500	U2
HU	PAN	6250	Pannonic loess steppic grasslands	98%	20,000	U2
HU	PAN	6260	Pannonic sand steppes	99%	48,000	U2
HU	PAN	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	97%	8,000	U2
HU	PAN	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	80%	1,500	U2
HU	PAN	6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	90%	50,000	U2
HU	PAN	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	78%	25,200	U2
HU	PAN	6520	Mountain hay meadows	100%	800	U2
HU	PAN	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>	100%	1,000	U1
HU	PAN	7230	Alkaline fens	100%	1,300	U2
HU	PAN	8230	Siliceous rock with pioneer vegetation of the <i>Sedo-Scleranthion</i> or of the <i>Sedo albi-Veronicion dillenii</i>	68%	60	FV
IE	ATL	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	11%	7,061	U2
IE	ATL	21A0	Machairs	17%	2,753	U2
IE	ATL	4030	European dry heaths	32%	680,700	U1
IE	ATL	4060	Alpine and Boreal heaths	14%	12,800	U1
IE	ATL	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	23%	53,100	U2

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
IE	ATL	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	51%	20,000	U2
IE	ATL	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	12%	1,468	U2
IE	ATL	7230	Alkaline fens	41%	6,840	U2
IE	ATL	8240	Limestone pavements	93%	36,300	U1
IT	CON	2190	Humid dune slacks	16%	500	U1
IT	MED	2190	Humid dune slacks	46%	1,200	U1
IT	CON	2250	Coastal dunes with <i>Juniperus</i> spp.	57%	400	U2
IT	MED	2250	Coastal dunes with <i>Juniperus</i> spp.	55%	9,700	U1
IT	CON	4060	Alpine and Boreal heaths	73%	5,300	FV
IT	CON	4090	Endemic oro-Mediterranean heaths with gorse	100%	400	FV
IT	ALP	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	12%	4,200	FV
IT	CON	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	16%	11,400	FV
IT	MED	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	57%	8,100	FV
IT	ALP	5210	Arborescent matorral with <i>Juniperus</i> spp.	35%	2,400	FV
IT	CON	5210	Arborescent matorral with <i>Juniperus</i> spp.	100%	1,800	FV
IT	CON	5330	Thermo-Mediterranean and pre-desert scrub	100%	400	U1
IT	MED	5430	Endemic phrygas of the Euphorbio-Verbascion	37%	16,700	FV
IT	ALP	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	18%	2,100	FV
IT	CON	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	28%	2,200	FV
IT	ALP	6170	Alpine and subalpine calcareous grasslands	17%	108,400	FV

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
IT	CON	6170	Alpine and subalpine calcareous grasslands	65%	9,900	FV
IT	ALP	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	24%	43,600	FV
IT	CON	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	27%	56,500	FV
IT	MED	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	62%	158,800	FV
IT	ALP	6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	100%	1,500	FV
IT	CON	6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	100%	2,800	FV
IT	MED	6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	14%	210,100	FV
IT	ALP	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	18%	43,100	FV
IT	CON	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	13%	6,800	FV
IT	ALP	6240	Sub-pannonic steppic grassland	13%	300	U1
IT	ALP	62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	16%	3,700	FV
IT	CON	62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	10%	4,500	FV
IT	ALP	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	18%	3,800	U1
IT	ALP	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	93%	200	XX
IT	CON	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	100%	1,300	XX
IT	ALP	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	42%	22,600	FV
IT	CON	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	11%	7,400	FV
IT	MED	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	10%	9,000	FV

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
IT	ALP	6520	Mountain hay meadows	26%	14,200	U1
IT	CON	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	18%	1,300	FV
IT	MED	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	30%	800	FV
IT	MED	7230	Alkaline fens	20%	700	FV
IT	ALP	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	76%	15,100	FV
IT	CON	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	42%	2,400	FV
IT	ALP	8240	Limestone pavements	24%	11,600	FV
IT	MED	8240	Limestone pavements	82%	3,700	FV
LT	BOR	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	27%	1,100	U1-
LT	BOR	2140	Decalcified fixed dunes with <i>Empetrum nigrum</i>	20%	60	U2
LT	BOR	2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	16%	210	U2
LT	BOR	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	87%	2,300	U2-
LT	BOR	4030	European dry heaths	21%	2,000	XX
LT	BOR	6120	Xeric sand calcareous grasslands	93%	1,000	U2-
LT	BOR	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	18%	4,000	U2-
LT	BOR	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	14%	500	U2-
LT	BOR	6270	Fennoscandian lowland species-rich dry to mesic grasslands	13%	5,200	U1-
LT	BOR	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	34%	4,400	U1

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
LT	BOR	6450	Northern boreal alluvial meadows	20%	8,600	U1
LT	BOR	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	61%	12,000	U1
LV	BOR	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	31%	1,280	U1
LV	BOR	2190	Humid dune slacks	12%	91	U1
LV	BOR	4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	29%	200	XX
LV	BOR	4030	European dry heaths	12%	1,200	U1
LV	BOR	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	12%	1,600	FV
LV	BOR	6450	Northern boreal alluvial meadows	16%	7,000	U2
LV	BOR	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	13%	2,500	U1
NL	ATL	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	16%	10,000	U2
NL	ATL	2310	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>	59%	8,000	U2
NL	ATL	2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	52%	1,000	U1
NL	ATL	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	13%	1,500	U2
PL	CON	1340	Inland salt meadows	42%	1,060	U2
PL	CON	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	42%	6,000	U2
PL	CON	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	25%	4,500	U2
PL	CON	4030	European dry heaths	20%	20,000	U2
PL	CON	6120	Xeric sand calcareous grasslands	54%	5,000	U2
PL	CON	6440	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	36%	3,110	U1
PL	ALP	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	25%	40,000	U1

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
PL	CON	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	60%	665,400	U1
PL	ALP	6520	Mountain hay meadows	18%	10,000	U2
PL	CON	6520	Mountain hay meadows	67%	110,000	U1
PL	CON	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	17%	1,200	U1
PT	MAC	4060	Alpine and Boreal heaths	100%	1,900	FV
PT	MAC	6180	Macaronesian mesophile grasslands	100%	14,139	U1
PT	MED	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	35%	12,960	U1
PT	MAC	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	100%	2,990	FV
RO	BLS	1530	Pannonic salt steppes and salt marshes	N/A	N/A	N/A
RO	CON	1530	Pannonic salt steppes and salt marshes	N/A	N/A	N/A
RO	STP	1530	Pannonic salt steppes and salt marshes	N/A	N/A	N/A
RO	BLS	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	N/A	N/A	N/A
RO	STP	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	N/A	N/A	N/A
RO	BLS	2190	Humid dune slacks	N/A	N/A	N/A
RO	MED	2190	Humid dune slacks	N/A	N/A	N/A
RO	STP	2190	Humid dune slacks	N/A	N/A	N/A
RO	MED	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	N/A	N/A	N/A
RO	MED	2340	Pannonic inland dunes	N/A	N/A	N/A

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
RO	ALP	4060	Alpine and Boreal heaths	N/A	N/A	N/A
RO	CON	4060	Alpine and Boreal heaths	N/A	N/A	N/A
RO	ALP	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	N/A	N/A	N/A
RO	CON	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	N/A	N/A	N/A
RO	CON	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	N/A	N/A	N/A
RO	ALP	6150	Siliceous alpine and boreal grasslands	N/A	N/A	N/A
RO	CON	6150	Siliceous alpine and boreal grasslands	N/A	N/A	N/A
RO	CON	6170	Alpine and subalpine calcareous grasslands	N/A	N/A	N/A
RO	ALP	6190	Rupicolous pannonic grasslands (Stipo-Festucetalia pallentis)	N/A	N/A	N/A
RO	CON	6190	Rupicolous pannonic grasslands (Stipo-Festucetalia pallentis)	N/A	N/A	N/A
RO	ALP	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	N/A	N/A	N/A
RO	CON	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	N/A	N/A	N/A
RO	CON	6240	Sub-pannonic steppic grassland	N/A	N/A	N/A
RO	BLS	6260	Pannonic sand steppes	N/A	N/A	N/A
RO	CON	6260	Pannonic sand steppes	N/A	N/A	N/A
RO	STP	6260	Pannonic sand steppes	N/A	N/A	N/A
RO	ALP	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	N/A	N/A	N/A
RO	BLS	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	N/A	N/A	N/A

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
RO	CON	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	N/A	N/A	N/A
RO	STP	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	N/A	N/A	N/A
RO	BLS	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	N/A	N/A	N/A
RO	STP	6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion)	N/A	N/A	N/A
RO	ALP	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	N/A	N/A	N/A
RO	BLS	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	N/A	N/A	N/A
RO	CON	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	N/A	N/A	N/A
RO	ALP	6440	Alluvial meadows of river valleys of the Cnidion dubii	N/A	N/A	N/A
RO	BLS	6440	Alluvial meadows of river valleys of the Cnidion dubii	N/A	N/A	N/A
RO	CON	6440	Alluvial meadows of river valleys of the Cnidion dubii	N/A	N/A	N/A
RO	STP	6440	Alluvial meadows of river valleys of the Cnidion dubii	N/A	N/A	N/A
RO	BLS	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	N/A	N/A	N/A
RO	STP	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	N/A	N/A	N/A
RO	ALP	6520	Mountain hay meadows	N/A	N/A	N/A
RO	CON	6520	Mountain hay meadows	N/A	N/A	N/A
RO	BLS	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	N/A	N/A	N/A
RO	STP	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	N/A	N/A	N/A
RO	ALP	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	N/A	N/A	N/A
RO	BLS	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion	N/A	N/A	N/A

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
			dillenii			
RO	CON	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	N/A	N/A	N/A
SE	BOR	1630	Boreal Baltic coastal meadows	23%	5,000	U2
SE	CON	1630	Boreal Baltic coastal meadows	100%	1,500	U2+
SE	BOR	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	22%	900	U2-
SE	BOR	2140	Decalcified fixed dunes with <i>Empetrum nigrum</i>	33%	100	FV
SE	BOR	2190	Humid dune slacks	27%	200	U2
SE	BOR	2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	76%	1,000	U2
SE	CON	2320	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	27%	400	U2
SE	CON	2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	14%	2,500	U2
SE	BOR	4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	71%	500	U2-
SE	BOR	4030	European dry heaths	52%	5,100	U2-
SE	ALP	4060	Alpine and Boreal heaths	57%	1,730,000	FV
SE	BOR	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	43%	4,300	XX
SE	BOR	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	98%	160	U2-
SE	ALP	6150	Siliceous alpine and boreal grasslands	40%	310,000	FV
SE	BOR	6150	Siliceous alpine and boreal grasslands	40%	200	FV
SE	ALP	6170	Alpine and subalpine calcareous grasslands	25%	155,000	FV
SE	BOR	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	55%	12,600	U2-

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
SE	BOR	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	77%	2,800	U2-
SE	BOR	6270	Fennoscandian lowland species-rich dry to mesic grasslands	67%	27,000	U2-
SE	CON	6270	Fennoscandian lowland species-rich dry to mesic grasslands	100%	4,300	U2-
SE	BOR	6280	Nordic alvar and precambrian calcareous flatrocks	45%	8,300	U2-
SE	CON	6280	Nordic alvar and precambrian calcareous flatrocks	100%	16,500	FV
SE	ALP	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	12%	2,600	U2-
SE	BOR	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	78%	20,000	U2-
SE	CON	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	18%	9,000	U2-
SE	ALP	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	13%	7,000	FV
SE	ALP	6450	Northern boreal alluvial meadows	100%	2,700	U2-
SE	BOR	6450	Northern boreal alluvial meadows	14%	6,100	U2-
SE	BOR	6520	Mountain hay meadows	48%	140	U2-
SE	BOR	6530	Fennoscandian wooded meadows	14%	760	U2-
SE	CON	6530	Fennoscandian wooded meadows	100%	20	U2-
SE	BOR	7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricon davallianae	66%	7,500	FV
SE	ALP	7230	Alkaline fens	34%	13,600	FV
SE	BOR	7230	Alkaline fens	45%	71,800	U1-
SE	BOR	8230	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	25%	5,000	U1-

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
SE	BOR	8240	Limestone pavements	74%	580	U1
SE	BOR	9070	Fennoscandian wooded pastures	165%	39,500	U2-
SI	CON	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	40%	28,000	FV
SI	ALP	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	11%	20,000	U2
SI	CON	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	19%	40,000	U2
SI	ALP	62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	84%	20,000	U2
SI	CON	62A0	Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> )	90%	40,000	U2
SI	ALP	6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )	11%	6,000	U1
SI	ALP	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	13%	7,000	FV
SI	ALP	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	12%	20,000	U2
SI	ALP	6520	Mountain hay meadows	18%	10,000	U1
SK	ALP	1340	Inland salt meadows	98%	25	U2
SK	PAN	1340	Inland salt meadows	90%	250	U2
SK	PAN	2340	Pannonic inland dunes	58%	685	U1
SK	PAN	4030	European dry heaths	84%	540	FV
SK	PAN	6110	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi	19%	12	U1
SK	PAN	6120	Xeric sand calcareous grasslands	100%	15	U2-
SK	ALP	6190	Rupicolous pannonic grasslands ( <i>Stipo-Festucetalia pallentis</i> )	100%	911	FV
SK	PAN	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	33%	4,366	XX
SK	ALP	6240	Sub-pannonic steppic grassland	22%	500	U1

MS	BioGeo Region	Habitat code	Habitat	% of total per BGR	Area (ha)	Status
SK	ALP	6250	Pannonic loess steppic grasslands	100%	235	XX
SK	PAN	6430	Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels	19%	358	U1
SK	ALP	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	35%	56,320	FV
SK	PAN	6510	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> )	19%	6,240	U1
UK	ATL	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	36%	22,300	U2-
UK	ATL	2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	62%	900	U2-
UK	ATL	2190	Humid dune slacks	13%	1,812	U2-
UK	ATL	21A0	Machairs	83%	13,300	U2-
UK	ATL	2250	Coastal dunes with <i>Juniperus</i> spp.	91%	20	U2
UK	ATL	4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>	99%	462,000	U2-
UK	ATL	4030	European dry heaths	28%	608,022	U2-
UK	ATL	4040	Dry Atlantic coastal heaths with <i>Erica vagans</i>	37%	599	FV
UK	ATL	4060	Alpine and Boreal heaths	46%	42,100	U2
UK	ATL	6150	Siliceous alpine and boreal grasslands	100%	70,000	U2
UK	ATL	6170	Alpine and subalpine calcareous grasslands	100%	680	U2+
UK	ATL	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	22%	51,300	U2+
UK	ATL	6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in continental Europe)	24%	4,194	U2
UK	ATL	6520	Mountain hay meadows	100%	1,100	U2+

## ANNEX D - Management recommendations for each Annex I habitat type dependent on agricultural management

**This table** shows examples of recommendations for the management of each key Annex I habitat type dependent on agricultural management. Recommendations are *not* prescriptive and management should be adapted to the local conditions, using the best available local knowledge. Experts for each habitat are available in many Member States and should be part of the design process. This table should be used in conjunction with the table describing the key habitat types dependent on agricultural management in Annex A. References are listed for each habitat type, with full details below.

**Agri dep** = dependency on agriculture from Halada et al (2011): **f** = Fully dependent on agricultural management, **p** = Partially dependent because management either prolongs the existence of the habitat by blocking succession, or enlarges/maintains an enlarged area of habitat distribution, **p/n** = Partially dependent only for some sub-types or over part of the distribution, or doubts remain concerning their dependence on agricultural management. Where Halada et al (2011) and Sipkova et al (2010) disagree, the Sipkova et al (2010) ranking is indicated in brackets. **NB** dunes with woody scrub (2160 dunes with *Hippophae rhamnoides* and 2170 dunes with *Salix repens* ssp. *argentea* (Salicion arenariae) are not included, although they are often dependent on periodic scrub clearance to prevent succession. Also not included although sometimes dependent on management: 7150 Depressions on peat substrates of the Rhynchosporion (habitat occurs in small patches within larger habitat mosaic and only requires occasional management); 7140 Transition mires and quaking bogs (require low intensity grazing if drained).

References: Halada, L, Evans, D, Romão, C and Petersen, J-E (2011) Which habitats of European importance depend on agricultural practices? *Biodiversity and Conservation*, No 20, (11) pp2365-2378. Sipkova, Z., Balzer, S., Evans, D. & Ssymanek, A. (2010) Assessing the conservation status of European Union habitats - results of the Community report with a case study of the German National Report. *Annali di Botanica*. <http://laboratoriocritico.uniroma1.it/index.php/Annalidibotanica/article/view/9103>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
<b>COASTAL AND HALOPHYTIC HABITATS</b>					
1330 Atlantic salt meadows  <b>p/n</b>	Introduction of grazing on historically ungrazed areas is detrimental, but on historically heavily grazed salt marshes and coastal meadows reduction or cessation of grazing results in a dense overgrown, species-poor sward unsuitable for grazing and breeding birds. So management depends on conservation objectives.	<b>Scrub:</b> Control invasive shrubs including <i>Baccharis halimifolia</i> . Shrubs and trees are detrimental to breeding birds because they provide viewpoints for predators. <b>Cuttings:</b> should be removed Mowing may be alternative to grazing in particular sites <b>Fertiliser:</b> no fertilisation	Regular flooding by brackish sea water should be maintained or restored by removal of barriers such as sea walls. Habitat usually occurs together with 1310 ' <i>Salicornia</i> and other annuals colonising mud and sand' which	Only secondary habitat areas that were historically grazed or mown require management. Restoration or management measures may be necessary to balance erosion or accretion of sediment. Regulated tidal exchange or de-embankment through managed re-alignment of coastal defences can restore saltwater influence on degraded saltmarsh.	(BfN, 2011) (JNCC, 2007a) (Ministerie van Economische Zaken, Landbouw en Innovatie, 2012) (National Parks and Wildlife Service, 2008) (Bensettiti and Trouvilliez, 2009) (McCorry and Ryle, 2009)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<p><b>Intensity:</b> vegetation is sensitive to changes in grazing, which could have knock-on effects for other species. Hence species dependent management prescriptions can be very specific based on country and tidal zone. Habitat usually occurs together with 1310 'Salicornia and other annuals colonising mud and sand' which may be grazed with saltmarsh.</p> <p><b>Stock type:</b> hardy cattle or horses preferred.</p> <p><b>Seasonality:</b> No winter grazing</p>		is also regularly flooded.	Good water quality is an important influencing factor.	
1340 Inland salt meadows  p	<p><b>Intensity:</b> extensive, approx. 1LU/ha or less. Grazing intensity must be adapted to the site,</p> <p><b>Seasonality:</b> July to October. No winter grazing.</p> <p><b>Folding:</b> inappropriate.</p>	<p>Cutting can be alternative to grazing. Cutting and/or grazing should be sufficiently intensive to prevent <i>Phragmites</i> expansion.</p> <p><b>Seasonality:</b> In Slovakia mowing before summer is recommended <i>except</i> in areas important for nesting birds, which should be mown only after mid-June/mid-July. In France a late cut is recommended.</p> <p><b>Fertiliser:</b> may tolerate low input of manure (&lt;30kg N/ha per year).</p>	<p>Seepage or periodic flooding by saline groundwater must be maintained. No drainage permitted.</p>	<p>Only secondary habitat areas that were historically grazed or mown require management. Protection from conversion to arable is a high priority.</p>	(Muller, 2002) and references therein (BfN, 2011; INPN, 2011; SOPSR, 2012)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
		<p><b>Treatment of cuttings:</b> should be removed.</p> <p><b>Scrub:</b> occasional winter removal with hand mower if necessary.</p>			
<p>1530 Pannonic salt steppes and salt marshes</p> <p><b>p/n</b></p>	<p><b>Intensity:</b> extensive. On Solonetz soils: 1 bovine/horse or 5–6 sheep/ha. On Solonchak soils, half this.</p> <p><b>Seasonality:</b> grazing period should be based on precipitation in previous and current year (delayed if dry spring, earlier in wet spring with early vegetation growth). Winter grazing should be prohibited.</p> <p><b>Stock type:</b> traditional indigenous breeds of sheep, cattle, goats, horses or buffalo. Geese suitable in some areas. Stock type should be tailored to site.</p>	<p>Mowing to eliminate weeds and expansive species (eg <i>Phragmites australis</i>) on pastures.</p> <p><b>Seasonality:</b> before summer <i>except</i> in areas important for nesting birds, which should be mown only after end of breeding bird nesting season.</p> <p><b>Method:</b> machinery appropriate only on dry soils.</p> <p><b>Treatment of cuttings:</b> should be removed as soon as possible.</p> <p><b>Fertiliser:</b> manure or fertiliser inappropriate.</p>	<p>Dams, canals and ditches should be removed (where no threat to settlements) to restore hydrological regime.</p>	<p>The rare primary (undrained and ungrazed) alkali <i>Artemisia</i> steppes are not dependent on management. Protection from conversion to arable is high priority.</p> <p><b>Burning</b> may be suitable.</p>	<p>(ŠeffEROVÁ et al, 2008a) (Valachovic et al, 2007) (SOPSR, 2012) (Batáry et al, 2007a) (Batáry et al, 2007b)</p>
<p>1630 Boreal Baltic coastal meadows</p> <p><b>p</b></p>	<p>Habitat has a number of stable states and appropriate management varies according to conservation aims and management history.</p> <p><b>General recommendations:</b> Create a diverse sward supporting a range of taxa.</p> <p><b>Intensity:</b> generally moderate</p>	<p>Mowing should be continued in any areas that were traditionally mowed. Can be used to manage expansive species (eg <i>Spartina</i>). Can be used to supplement low grazing rates. Traditional mowing followed by grazing is optimal regime for plants and</p>	<p>Regular flooding by brackish sea water should be maintained or restored by removal of barriers such as sea walls. Habitat usually occurs together with 1310</p>	<p><b>Mosaic burning</b> in early spring on frozen ground can be used to remove dense vegetation (“foggage”) from abandoned coastal meadows.</p> <p><b>Dig shallow open ponds</b> for <i>Bufo calamita</i> and <i>Bufo viridis</i> breeding, and erect <b>fencing</b> that encourages cattle to trample in and around</p>	<p>(Doody, 2008) (Lotman, 2004) See (Rannap et al, 2004) for specific prescriptions.</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<p>grazing (5–6 sheep or 1–1.5 young cattle/ha). In Estonia, low intensity of 0.4 and 1.3 livestock units per hectare (lu/ha) recommended.</p> <p><b>Tailored management:</b> Moderate grazing intensity during breeding season is important for nesting water birds to leave longer vegetation clumps as protection for nests and to avoid trampling many eggs. Grazing should start early in the spring (timing depending on the latitude). Grazing management history should guide management, together with observations and current knowledge about needs of breeding bird species.</p> <p><b>Abandoned areas</b> may require initial intense grazing followed by moderate grazing.</p> <p><b>Seasonality:</b> April–October (May in Scandinavia), or year round when intensity low (0.6 cattle/ha). <b>Regime:</b> grazing can be constant, adjusted constant (lower stocking rate in late summer) or rotational. A mosaic regime may be used</p>	<p>invertebrates.</p> <p><b>Seasonality:</b> as late as possible, after breeding bird nesting season.</p> <p><b>Treatment of cuttings:</b> should be removed as soon as possible.</p> <p><b>Scrub and reed:</b> brush-cutting in late summer (after end of breeding bird nesting season) to restore abandoned meadows, with stump removal on mown meadows. Or reed cutting and removal in winter when ground is frozen.</p> <p><b>Fertiliser:</b> application of manure or fertiliser is inappropriate.</p>	<p>‘<i>Salicornia</i> and other annuals colonising mud and sand’ which is also regularly flooded.</p>	<p>ponds to keep them open and create minimally vegetated ground for the toads to hunt.</p>	

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<p>during restoration, including early season grazing to control <i>Phragmites</i> and <i>Typhus</i> Invasion.</p> <p><b>Stock type:</b> a mix of stock types (beef cattle, horses, sheep and/or goats) is recommended.</p> <p><b>Supplementary feeding:</b> should be avoided.</p> <p><b>Fencing:</b> Ideally, fences should go right into water so that livestock graze all vegetation, with removal in winter before ice comes.</p> <p><b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates.</p>				
<b>COASTAL SAND DUNES AND INLAND DUNES</b>					
<p>2130 Fixed coastal dunes with herbaceous vegetation (“grey dunes”)</p> <p><b>p/n</b></p>	<p>Depends on management history, vegetation trends, current land use, and nitrogen deposition. Some grey dunes should be left alone.</p> <p><b>General recommendations:</b> Maintenance of a fine grained mosaic of open-sand, moss-, lichen- and low grass cover.</p> <p><b>Intensity:</b> extensive, but enough to control scrub</p>	<p>Mowing occasionally used, but inferior to grazing. May be necessary to clear dense scrub prior to grazing.</p> <p><b>Treatment of cuttings:</b> should be removed as soon as possible.</p> <p><b>Fertiliser:</b> strictly no additional fertilisation (nutrient levels must be kept low). Measures to control</p>	<p>The habitat relies on the natural dynamics of the dune system caused by sand drift from wave and wind action, which requires modification of fixed coastal protection structures such as sea walls, and</p>	<p><b>Fencing and path management</b> to limit erosion due to trampling by visitors and vehicle damage (but some small-scale erosion may be beneficial).</p> <p><b>Restoration</b> may involve removal of forestry plantations and/or artificial large-scale destabilisation. Protect reptile habitats when undertaking restoration measures (keep them careful &amp; small-scale to</p>	<p>(INPN, 2011) (VV.AA, 2009) (Houston, 2008a) and references within (Søgaard et al, 2007) (Tahmasebi Kohyani et al, 2008) (BfN, 2011)</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<p>invasion and to maintain low level erosion dynamics.  <b>Seasonality:</b> moderate stocking rates in summer, higher in autumn and winter. Either year round low intensity or seasonal higher intensity.  <b>Stock type:</b> mix of species including sheep and horses; traditional/rare breeds often most effective. Rabbit grazing is an important influence, but reintroduction is often difficult.  <b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates.</p>	<p>impacts of eutrophication on vegetation may be necessary, such as turf removal / sod cutting of tall grasses, small-scale ploughing.  <b>Scrub:</b> site-specific management. Mechanical or manual clearance with removal of cuttings, stumps and topsoil. Important to remove <b>invasive species</b> e.g. <i>Pinus spp.</i>, <i>Acacia</i> sp. pl., <i>Cortaderia selloana</i>, <i>Carpobrotus edulis</i>, <i>Prunus serotina</i>, <i>Rosa rugosa</i></p>	<p>integrated management of the whole dune system.</p>	<p>maintain refuges). Open patches will also benefit <i>Bufo calamita</i>.</p>	
<p>2140  Decalcified fixed dunes with <i>Empetrum nigrum</i>  p/n</p>	<p><b>Intensity:</b> light, but sufficient to suppress scrub encroachment and maintain crowberry and some open patches for mosses, lichens, herbs etc.  <b>Supplementary feeding:</b> should be avoided.  <b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates.</p>	<p><b>Fertiliser:</b> strictly no additional fertilisation (nutrient levels must be kept low). Measures to control impacts of eutrophication on vegetation may be necessary, such as turf removal / sod cutting, small-scale ploughing.  <b>Scrub:</b> cutting may be required where abandonment has led to tree and shrub encroachment.</p>	<p>Some subtypes require influx of groundwater.</p>	<p>Control of <b>invasive species</b> may be necessary.</p>	<p>(Pihl et al, 2001)  (Søgaard et al, 2007)  (VV.AA, 2009)  (BfN, 2011;  Ministerie van Economische Zaken, Landbouw en Innovatie, 2012)</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
2150 Atlantic decalcified fixed dunes (Calluno-Ulicetea)  <b>p/n</b>	<b>Intensity:</b> light, sufficient to suppress scrub encroachment and maintain variety of ages of <i>Calluna</i> .	<b>Scrub:</b> cutting may be required where abandonment has led to tree and shrub encroachment. <b>Fertiliser:</b> strictly no additional fertilisation (nutrient levels must be kept low). Measures to control impacts of eutrophication on vegetation may be necessary, such as turf removal / sod cutting, small-scale ploughing.		Control of <b>invasive species</b> may be necessary. Removal of forestry plantations. Some habitat creation through natural succession from habitat type 2130 “grey dunes”.	(INPN, 2011) (VV.AA, 2009) (Halada et al, 2011) (ICNB, 2006) (National Parks and Wildlife Service, 2008) (Ministerie van Economische Zaken, Landbouw en Innovatie, 2012) (BfN, 2011; Søggaard et al, 2007)
2190 Humid dune slacks  <b>p</b>	Intact dune slacks do not need management. <b>Intensity:</b> extensive. <b>Stock type:</b> sheep ideal, but cattle or horses preferred in wetter areas. Hardy breeds should be used eg Devon red cattle, Herdwick sheep. Rabbits should be encouraged with artificial burrows and access strips. <b>Regime:</b> typically, a single stock species is used seasonally at a set density.	<b>Seasonality:</b> frequency and timing will depend on the habitat and conservation aims. <b>Scrub:</b> removal may be necessary where invasion has occurred. Can be by hand or using chainsaws, brush-cutters and tractors with specialised rakes. Stumps should be treated with herbicide. Must be carefully planned and controlled. Must be followed with mowing or grazing.	Drainage canals should be blocked and water levels raised, eg using ‘infiltration water’ drawn from rivers. Coastal tidal and flood regime should be maintained.	Regular ‘ <b>sand blow-out</b> ’ should be maintained. <b>Sodcutting</b> may be appropriate to reduce impacts of eutrophication and control succession.	(INPN, 2011) (VV.AA, 2009) (Houston, 2008b) (ŠeffEROVÁ et al, 2008a) (BfN, 2011; Grootjans et al, 2002)
21A0 Machairs  <b>f</b>	<b>Intensity:</b> extensive. Stocking rates and ratio of sheep to cattle are critical. <b>Seasonality:</b> summer grazing	<b>Seasonality:</b> cutting should be for hay not silage, as cut will be later in year, allowing plants to set seed.		Machair has a <b>traditional rotating cropping pattern</b> of grazing and small areas of extensive arable crops for winter fodder. The arable	(National Parks and Wildlife Service, 2008) (JNCC, 2007b)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	on mountains surrounding Machairs, and wintering on the commonage. <b>Regime:</b> removal of fences and return to open grazing <i>or</i> rotational grazing.	<b>Fertiliser:</b> limited use of fertiliser, no herbicide use.		habitat is in the more critical condition because of earlier harvesting.	(RSPB, 2012)
2250 Coastal dunes with <i>Juniperus</i> species <b>p</b>	Essential to support juniper regeneration. <b>Intensity:</b> extensive. <b>Stock type:</b> preferably sheep, but sometimes cattle	<b>Scrub:</b> scrub and tree removal may be necessary. Should be followed by grazing.		Control of <b>invasive species</b> may be necessary. <b>Fire prevention</b> measures necessary.	(INPN, 2011) (VV.AA, 2009) (Picchi, 2008) (Fuller et al, 2010)
2310 Dry sandy heaths with <i>Calluna</i> and <i>Genista</i> <b>p/n (or f)</b>	<b>Intensity:</b> extensive grazing – needs careful control of stocking levels and intensity to restore and maintain desired vegetation. <b>Stocking type:</b> mixed grazing of cattle and sheep is recommended to reduce <i>Molinia</i> , however cattle should be removed as soon as there is evidence the heather is being eaten. Stocking levels need to take into account breed and age as well as species mix. <b>Regime:</b> rotational grazing with variation of both presence of grazing and single stock with mixed stock is recommended to produce heterogeneous habitat that can benefit both plants and invertebrates.	<b>Fertiliser:</b> strictly no additional fertilisation (nutrient levels must be kept low). Measures to control impacts of eutrophication on vegetation may be necessary, such as turf removal / sod cutting (plaggen), small-scale ploughing (heaths were traditionally subject to peat cutting and heath harvesting, which removed nutrients). <b>Scrub:</b> scrub and tree removal may be necessary, including control of woody invasive species.		Small-scale burning of <i>Molinia</i> grass may be useful to help restore <i>Calluna</i> cover. Habitat is highly fragmented – area expansion and habitat creation would be very beneficial for long-term conservation.	(BfN, 2011; Ministerie van Economische Zaken, Landbouw en Innovatie, 2012; Søgaard et al, 2007)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock should be avoided.				
2320 Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>  <b>p/n</b> <b>(or f)</b>	Same as for 2310	Same as for 2310		Same as for 2310 It is important to create areas with open sand in the habitat. Animal grazing is often not enough and thus other ways of regular disturbance is needed. Many high nature value areas are used or have been used for military training which has created the necessary mosaic sand structures. Burning may be beneficial for some species in this habitat.	(BfN, 2011; Ministerie van Economische Zaken, Landbouw en Innovatie, 2012; Søggaard et al, 2007)
2330 Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grassland  <b>p/n</b> <b>(or f)</b>	<b>Intensity:</b> very extensive, sufficient to suppress scrub and tree encroachment and maintain dynamics of open sand. <b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation status.	Regular cutting necessary to prevent succession to scrub or heath.		Control/limit <b>sand quarrying</b> actions and infrastructure development. Problems with invasive moss species <i>Campylopus introflexus</i> . It is important to create areas with open sand in the habitat. Animal grazing is often not enough and thus other ways of regular disturbance is needed. Many high nature value areas are used or have been used for military training which has created the necessary mosaic sand structures.	(INPN, 2011) (Ministerie van Economische Zaken, Landbouw en Innovatie, 2012) (AOPK CR, 2007; Riksen et al, 2006) (BfN, 2011)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
2340 Pannonic inland dunes  f	<b>Intensity:</b> more intensive during first few years of restoration, then at level sufficient to provide disturbance. <b>Regime and stock type:</b> variation in grazing pressure in order to maintain mosaic of open and closed swards.	<b>Scrub:</b> mechanical removal of scrub and trees may be necessary. <b>Fertiliser:</b> no fertiliser input; humus layer may be removed to prevent nutrient enrichment.		In some circumstances carefully managed winter <b>burning</b> may be suitable.	(Valachovic et al, 2007) (SOPSR, 2012)
<b>TEMPERATE HEATH AND SCRUB</b>					
4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>  f (or p/n)	Undisturbed wet heath areas do not require management. However most heaths are now threatened by eutrophication and drainage. <b>Intensity:</b> extensive grazing that is sufficient to keep down trees and leggy heather, but not so intense that heather is reduced and replaced by grassland eg <i>Molinia</i> . If bare peat is exposed grazing should be prevented. <b>Seasonality:</b> avoid winter grazing (graze when dry)	<b>Scrub:</b> tree removal essential for restoration. Rotational heath cutting may be necessary but must avoid use of heavy machinery that causes serious compaction and erosion problems. <b>Fertiliser:</b> strictly no use of manure or fertiliser, prevent eutrophication from use of fertilisers on nearby land, create buffer zones.	Hydrology needs to be managed in the wider habitat complex. Where possible, block existing drainage channels. Prevent further drainage but also ensure the habitat is not flooded.	Habitat has historically been managed with controlled <b>burning</b> at interval of 2–20 years in the UK, but is not now recommended unless preceded by careful impact assessment, as it tends to damage peat and encourage <i>Molinia</i> . Stop peat cutting. Small-scale periodic <b>sod-cutting</b> can maintain open patches for pioneer vegetation and invertebrates and help control <i>Molinia</i> .	(Hampton, 2008) (García et al, 2012) (Harris et al, 2011) (Newton et al, 2009) (Backshall et al, 2001; Tucker, 2003)
4020 Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>  f	Not recommended in Spain but considered necessary in the UK. If grazing occurs, it should be very extensive with strictly controlled stocking rates to prevent eutrophication, excessive grazing of sensitive	<b>Scrub:</b> tree removal where necessary, remove invasive species, with removal of all plant material. <b>Fertiliser:</b> strictly no use of manure or fertiliser, prevent eutrophication from use of	Where possible, block existing drainage channels. Prevent further drainage but also ensure the habitat is not flooded.	Carefully managed <b>burning</b> may be used in some areas at interval of 2–20 years in the UK, but not recommended in Spain unless preceded by careful impact assessment. Stop peat cutting.	(VV.AA, 2009) (ICNB, 2006) (JNCC, 2007b) (INPN, 2011) (Martín and Lopez, 2002) and references therein

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	plant species, and trampling damage.	fertilisers on nearby land, create buffer zones.			(Hampton, 2008) (Backshall et al, 2001; Tucker, 2003)
4030 European dry heaths  f	<b>Intensity:</b> extensive. Avoid eutrophication and grazing and trampling of sensitive plants from excessive stocking levels, including impact of wild grazers (deer etc.) However grazing needs to be sufficient to prevent tree colonisation and accumulation of woody material that has a high fire risk. <b>Seasonality:</b> avoid winter grazing	<b>Scrub:</b> tree removal where necessary, with removal of all plant material. Control invasive species including <i>Pteridium aquilinum</i> , <i>Rhododendron ponticum</i> , <i>Ulex galii</i> , <i>Gaultheria shallon</i> . <b>Fertiliser:</b> strictly no use of manure or fertiliser, prevent eutrophication from use of fertilisers on nearby land, create buffer zones.		In some circumstances carefully managed <b>burning</b> may be appropriate with post-burn monitoring. Very sensitive to uncontrolled burning which produces large areas of even-aged vegetation and loss of plant and invertebrate species. Manage human pressures to avoid erosion from recreational activities, and wild fire risk.	(García et al, 2012) (Harris et al, 2011) (Newton et al, 2009) (VV.AA, 2009)
4040 Dry Atlantic coastal heaths with <i>Erica vagans</i>  f	Not recommended.	<b>Scrub:</b> tree removal where necessary, with removal of all plant material. <b>Fertiliser:</b> strictly no use of manure or fertiliser, prevent eutrophication from use of fertilisers on nearby land, create buffer zones.		Control of <b>invasive species</b> may be necessary.	(VV.AA, 2009) (JNCC, 2007b) (INPN, 2011) (Martín & Lopez, 2002) (Valachovic et al, 2007) and references therein
4060 Alpine and boreal heaths  p/n	Only secondary habitat areas that were historically grazed require management. <b>Intensity:</b> extensive. Stocking rates must be tailored to type and age of vegetation and other local characteristics. Detailed grazing plans should	Cutting should be carefully planned and monitored. <b>Method:</b> by hand or mechanical.		In some circumstances managed <b>burning</b> may be appropriate, but this should be carefully planned and controlled, and used only when necessary, in balance with grazing.	(INPN, 2011) (VV.AA, 2009) (Zaghi, 2008) (DeGabriel et al, 2011) (Martín & Lopez, 2002) and references therein

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<p>be used.</p> <p><b>Seasonality:</b> in south and central Europe, limited to summer (June–October) based on traditional ‘transhumance’ regime. At lower altitudes, and further north (eg UK) grazing is year round.</p> <p><b>Stock type:</b> in Boreal regions, usually grazed by reindeer. In upland heathland in Scotland, mixed grazing by sheep with deer appears optimal.</p>				(Tucker, 2003) (Valachovic et al, 2007)
4090 Endemic oro-Mediterranean heaths with gorse  <b>p</b>	<p>Habitat very variable and conservation recommendations will differ between sites.</p> <p><b>Intensity:</b> extensive is optimum for many subtypes.</p> <p><b>Livestock type:</b> sheep preferred.</p>	<b>Scrub:</b> scrub clearance may be necessary and should be followed by extensive grazing.		Reintroducing traditional <b>burning</b> may be appropriate in some areas but should be based on management strategies and carried out carefully where there is low risk of creating wildfires.	(INPN, 2011) (VV.AA, 2009) (Beaufoy et al, 2011)
<b>SCLEROPHYLLOUS SCRUB (MATORRAL)</b>					
5120 Mountain <i>Cytisus purgans</i> formations  <b>p/n</b>	<p><b>Intensity:</b> extensive/moderate density</p> <p><b>Other:</b> can be used in combination with burning management</p>			<b>Burning</b> may be appropriate in some areas but should be based on management strategies and carried out carefully where there is low risk of creating wildfires.	(INPN, 2011) (Halada et al, 2011) (VV.AA, 2009)
5130 <i>Juniperus communis</i> formations on	<i>Juniperus</i> recruitment requires a carefully adjusted grazing regime to create and maintain the habitat mosaic.	<b>Scrub:</b> in the absence of grazing, scrub removal will be necessary.		Carefully managed <b>soil disturbance</b> and <b>weeding</b> may be beneficial. Burning is usually not an option because of high risk of fire getting	(INPN, 2011) (VV.AA, 2009) (BfN, 2011; Valachovic et al,

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
heaths or calcareous grasslands  p	<p><b>Intensity:</b> grazing should be sufficient to maintain short sward and bare patches. Heavy grazing will prevent seed germination, but in some climates grazing needs to be moderately high to stop overgrowth of scrub and loss of grassland.</p> <p><b>Seasonality:</b> intermittent grazing may be ideal eg with removal period of 10 years.</p> <p><b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation</p>			out of control. Propagation of juniper seedlings in nursery may improve recruitment.	<p>2007) (National Parks and Wildlife Service, 2008) (JNCC, 2007b) (Valachovic et al, 2007) (Beaufoy et al, 2011) (Lotman, 2004) (Ministerie van Economische Zaken, Landbouw en Innovatie, 2012) (SOPSR, 2012) (Cooper et al, 2012)</p>
5210 Arborescent matorral with <i>Juniperus</i> spp.  p/n	<p><b>Intensity:</b> moderate. Should be controlled by detailed 'pasturage plans' based on accurate field surveys of habitat. Overgrazing can result in trampling of juniper seedlings.</p> <p><b>Seasonality:</b> preferably limited to winter.</p> <p><b>Livestock type:</b> sheep and goats are preferable to limit compaction and due to their grazing habits.</p>	<p><b>Scrub:</b> invading scrub and trees should be cleared periodically. Older juniper should be pruned where this may encourage younger saplings.</p>		<p><b>Fire prevention</b> may be necessary in high risk areas. Subtype 'primary matorral' does not require active management</p>	<p>(INPN, 2011) (VV.AA, 2009) (Calaciura and Spinelli, 2008a) (Beaufoy et al, 2011)</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
5330 Thermo-Mediterranean and pre-desert scrub <b>p/n</b>	<b>Intensity:</b> very extensive, adapted to degree of aridity. <b>Regime:</b> livestock should be free ranging. Various subtypes - some subtypes should receive no grazing.	<b>Scrub:</b> maintain clearings as openings for germination and young successional stages and as fire breaks. Clear away invasive trees.		<b>Fire protection</b> measures necessary. Control of <b>invasive species</b> may be necessary.	(INPN, 2011) (VV.AA, 2009) (Halada et al, 2011) and references therein
5420 <i>Sarcopoterium spinosum</i> phryganas <b>p</b>	<b>Intensity:</b> moderate to high stocking rates. Vegetation is relatively resistant to grazing pressure. Traditionally extensively grazed by goats and/or sheep.			<b>Burning:</b> role of fire in habitat maintenance unclear. <i>Sarcopoterium spinosum</i> is capable of regeneration after fire.	(Papanastasis et al, 2002) (Ramón Vallejo et al, 2012) (Papanikolaou et al, 2011)
5430 Endemic phryganas of the Euphorbio-Verbascion <b>p</b>	<b>Intensity:</b> Vegetation is relatively resistant to grazing pressure. Traditionally extensively grazed by goats and/or sheep.			Control of <b>invasive species</b> may be necessary (eg <i>Carpobrotus</i> , <i>Pennisetum</i> ). <b>Fire protection</b> measures necessary.	(VV.AA, 2009) (Papanikolaou et al, 2011)
<b>NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS</b>					
6110 Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi <b>p/n</b>	Only secondary habitat areas that were historically grazed require management. <b>Intensity:</b> extensive. <b>Livestock type:</b> cattle. Grazing by rabbits is often crucial. <b>Regime:</b> grazing should be controlled; vegetation is favoured by a controlled level of trampling. A rotational regime may be suitable. <b>Other:</b> use of animal medicines, particularly worm			Habitat occurs in small patches so management must be integrated with <b>management of the wider landscape.</b>	(INPN, 2011) (VV.AA, 2009) (BfN, 2011)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation status.				
6120 Xeric sand calcareous grasslands  <b>p</b>	<b>Intensity:</b> extensive. <b>Livestock type:</b> in addition to livestock (type not defined), grazing by rabbits is crucial. <b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation status.	<b>Seasonality:</b> mowing should be carried out only once a year maximum. Should be followed by grazing.	Habitat susceptible to drought, some areas are reliant on flooding; regimes should be maintained	Remaining areas are very small and so reliant on <b>management of the wider landscape</b> . It is important to have sufficient disturbance to create areas with open sand and expose subsurface sand to maintain the necessary high pH. Due to leaching, the pH would otherwise with time be likely to fall to critical levels, at least at some sites. The disturbance from grazing animals is often not sufficient except on steep slopes.	(INPN, 2011) (Pihl et al, 2001) (Baranska et al, 2009; BfN, 2011)
6140 Siliceous Pyrenean <i>Festuca eskia</i> grasslands  <b>p</b>	Grazing and trampling are critical to maintaining the characteristic species in this habitat. <b>Intensity:</b> relatively high; approx. 6–7 sheep/ha <b>Livestock type:</b> preferably sheep. Some grazing by horses at the end of the summer may also be used. <b>Regime:</b> grazing by sheep in afternoon or early evening is recommended. Should be controlled by a shepherd.			In some circumstances carefully managed <b>Burning</b> may be used in combination with grazing.	(INPN, 2011) (VV.AA, 2009)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
6150 Siliceous alpine and boreal grasslands  <b>p</b>	<b>Intensity:</b> very low to extensive, depending on biogeographical region. A reduction or cessation of grazing can be required, although it varies greatly geographically. <b>Stock type:</b> cattle and ponies may be used as they graze coarser vegetation than sheep. Goats should be avoided as they can access remote remaining patches of the habitat type. In the Scandinavian Alpine and Boreal regions the habitat quality is dependent on the influence of reindeer grazing. A too intensive reindeer grazing pressure can however have local negative effects. Grazing by cattle, sheep and goats has been part of traditional grazing regimes in the proximity of summer farms. <b>Folding:</b> inappropriate.	Cutting should only be used if grazing measures do not encourage a varied vegetation structure. <b>Fertiliser:</b> Strictly no liming or fertiliser.		Some grasslands are best left alone. Need protection from recreational impacts eg skiing, mountain biking, especially if winter snow cover is reduced.	(Hughes, 2008) (INPN, 2011) (JNCC, 2007a) (Valachovic et al, 2007) (BfN, 2011) (SOPSR, 2012) (Valachovic et al, 2007)
6160 Oro-Iberian <i>Festuca indigesta</i> grasslands  <b>P</b>	<b>Intensity:</b> extensive. <b>Stock type:</b> sheep. <b>Regime:</b> traditional regimes should be maintained.		Water courses should not be altered.	Carefully planned and managed burning together with grazing to help control wildfires is recommended in Portugal, but in Spain the habitat should be protected from fire.	(VV.AA, 2009) (ICNB, 2006)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
6170 Alpine and subalpine calcareous grasslands  <b>p</b>	Some alpine grasslands should be left ungrazed. <b>Intensity:</b> extensive to moderate grazing; utilisation rate of 20–30% of above-ground plant production – eg 0.4LU/ha/yr in UK. <b>Stock type:</b> foraging by wild ungulates may be sufficient to maintain the habitat; continuation of historic grazing by ibex and chamois will benefit alpine species. In the Scandinavian Alpine and Boreal regions the habitat quality is dependent on the influence of reindeer grazing. A too intensive reindeer grazing pressure can however have local negative effects. Grazing by cattle, sheep and goats has been part of traditional grazing regimes in the proximity of summer farms. <b>Folding:</b> inappropriate.	Some scrub species which may encroach are also of conservation value so balance between scrub and grassland depends on which species are prioritised.		Habitat is found over large range and is very variable so <b>management should be locally tailored.</b> When the vegetative cover is altered or there is significant loss of soil, it is almost impossible to restore the original habitat.	(INPN, 2011) (VV.AA, 2009) (García-González, 2008) (Valachovic et al, 2007) (Barbaro et al, 2001) (Poschlod and WallisDeVries, 2002) (WallisDeVries et al, 2002) (Willems, 2001)
6180 Macaronesian mesophile grasslands  <b>P</b>	<b>Limited information available for this habitat type</b>			Habitat occurs in small patches with forest and scrub habitats.	(ICNB, 2008)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
6190 Rupicolous pannonic grasslands (Stipo-Festucetalia pallentis) f	<b>Intensity:</b> rates should be strictly controlled. <b>Stock type:</b> cattle, sheep and/or goats. <b>Folding:</b> inappropriate.	Mowing should be a maximum of once a year. Should be followed by grazing. <b>Fertiliser:</b> no fertilisation.	Restoration of hydrological regime.	<b>Goose farming</b> should be controlled.	(Valachovic et al, 2007) (SOPSR, 2012)
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) f (or p/n)	<b>Intensity:</b> low/moderate extensive. Stocking rates vary depending on length of grazing period and rate of sward production in different regions. <b>Stock type:</b> cattle, horses, sheep or goats may be used. Should be tailored to site conditions. Alternating stock types at a site where this is not usual will have negative impacts. <b>Seasonality:</b> delaying grazing until end of growing season beneficial for biodiversity, except on sites dominated by bracken where it may help break up dense stands. Winter grazing may be more effective. In some areas, traditional transhumance grazing should continue. Characteristic plant species require bare patches in the sward to germinate, so a certain amount of sward	Grazing usually preferable for invertebrates, but where habitat was traditionally mown, or where grazing is not practicable, extensive mowing may be more appropriate (eg steep sub-alpine meadows). <b>Frequency:</b> usually single cut, but varies from every two years to twice a year, depending on productivity. <b>Seasonality:</b> late in the year, after bird breeding and plant seed-setting. Timing will vary depending on region and nature of wildlife interest, and will be earlier for fertilised meadows with greater yields. <b>Regime:</b> cutting should be staggered; ideally, 5–10% of area left uncut until following year and different area left each year. Cut to about 8–		A combination of mowing and grazing is not desirable as it does not favour the characteristic species related to one or other of the practices.  Control or eradication of <b>invasive species</b> <i>Robinia pseudoacacia</i> , which threatens <i>Artemisia pancicii</i> populations in the Czech Republic.	(INPN, 2011) (VV.AA, 2009) (Calaciura and Spinelli, 2008b) (Beaufoy et al, 2011) (Crofts and Jefferson, 1999) (Harris et al, 2011) (Muller, 2002) (Søgaard et al, 2007) (Baranska et al, 2009) (BfN, 2011) (Valachovic et al, 2007)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	erosion in winter is beneficial. <b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation status.	10cm. <b>Treatment of cuttings:</b> should be removed immediately. <b>Fertiliser:</b> no fertilisation <b>Method:</b> cutter-bar mowers are more desirable than rotary mowers. <b>Scrub:</b> removal may be necessary but some should be left for diversity. Large stands should be reduced by staggered yearly cutting.			
6220 Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea  f	Grazing regime varies between habitat sub-types <sup>95</sup> .  <b>Subtype 1:</b> <b>Intensity:</b> 0.2–0.4 LU/ha/year (or higher to control woody vegetation) <b>Seasonality:</b> Spring or autumn <b>Stock type:</b> sheep or goats <b>Regime:</b> shepherding preferable <b>Other:</b> limited supplementary feeding.  <b>Subtype 2:</b> <b>Intensity:</b> 1 LU/ha/year (on closely related dehesa systems, much lower stocking rates	<b>Scrub:</b> mechanical removal of woody vegetation may be necessary, particularly for initial restoration. Should repeat every 3–5 years and be carried out in small, irregular plots to increase structural diversity.  <b>Fertiliser:</b> use of fertilisers (particularly N and K) and pesticides should be restricted.		In some circumstances carefully controlled <b>burning</b> management may be used in combination with grazing and mechanical scrub removal. Maintenance of <b>traditional mosaic</b> distribution of agricultural plots. <b>Field margins, beetle banks</b> and <b>fallow land</b> may be beneficial. <b>Silvicultural treatment</b> should be used in afforested areas.	(INPN, 2011) (VV.AA, 2009) (San Miguel, 2008) (Beaufoy et al, 2011) (Fuller et al, 2011)

<sup>95</sup> (García-González, 2008)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<p>needed; 0.2–0.3 LU/ha/year).  <b>Seasonality:</b> grazing from mid-autumn to late summer.  <b>Stock type:</b> sheep or cattle, sometimes goats and occasionally horses.  <b>Regime:</b> shepherding preferable  <b>Supplementary feeding:</b> cattle require relatively high rates of supplementary feeding.  <b>Subtype 3:</b>  <b>Intensity:</b> 0.1 LU/ha/year (or up to 0.5 LU for short period to remove woody vegetation).  <b>Seasonality:</b> usually spring, sometimes autumn depending on onset of rain.  <b>Stock type:</b> sheep or goat  <b>Regime:</b> shepherding preferable  Regimes should be tailored to local conditions and intensity should not be increased above traditional levels.</p>				
6230 Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and sub-mountain	<p>Habitat is highly dependent on regular grazing at the right intensity.  <b>Intensity:</b> varies between regions and sub-types; eg 04–0.6LU/ha in Poland and 0.3–1.0LU/ha in Slovakia.</p>	<p>Mowing is usually employed where productivity is too low to support grazing.  Combination of mowing and grazing is traditional in many parts of Europe.  <b>Treatment of cuttings:</b></p>		<p><b>Turf stripping</b> may be used during restoration.</p>	<p>(INPN, 2011)  (VV.AA, 2009)  (Galvánek and Janák, 2008)  (Valachovic et al, 2007)  (Chytry et al, 2007)</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
areas, in continental Europe) <b>f</b>	<p><b>Seasonality:</b> year-round grazing in Atlantic regions, seasonal grazing in Continental and Boreal regions. Traditional transhumance grazing should continue at higher altitudes.</p> <p><b>Stock type:</b> optimum stock type varies between regions.</p> <p><b>Regime:</b> rotational grazing suitable (eg 3 cycles each year) with small herds of &lt;15 LU grazing for up to 10 days in a single location. Fencing not advised. <b>Folding:</b> permitted in some locations in Slovakia, providing pens are moved each day. <b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation status.</p>	<p>leaving cuttings on ground may be necessary in very low nutrient systems.</p> <p><b>Fertiliser:</b> Generally, no fertilisation or liming is tolerated. Very low levels of manure may be suitable on low altitude grasslands.</p> <p><b>Other:</b> in the absence of grazing, artificial methods to open up bare ground may be necessary.</p> <p><b>Scrub:</b> clearance may be necessary for initial restoration.</p>			(Háková et al, 2004) (Carlin et al, 2010) (Muller, 2002) (Ceulemans et al, 2011) (SOPSR, 2012) (BfN, 2011) (Valachovic et al, 2007)
6240 Sub-pannonic steppic grasslands <b>p (p/n)</b>	<p><b>Intensity:</b> very low; maximum 0.8 LU/ha.</p> <p><b>Stock type:</b> sheep or goats.</p> <p><b>Folding:</b> inappropriate.</p> <p><b>Supplementary feeding:</b> restriction necessary to prevent nutrient enrichment.</p> <p><b>Other:</b> can combine with mowing.</p>	<p><b>Frequency:</b> at most once a year.</p> <p><b>Seasonality:</b> mow after end of breeding bird nesting season.</p> <p><b>Fertiliser:</b> no fertilisation.</p> <p><b>Other:</b> can be followed by grazing.</p>			(Sarbu et al, 2004) (Valachovic et al, 2007) (Zingstra et al, 2010) (SOPSR, 2012) (BfN, 2011)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
6250 Pannonic loess steppic grasslands  f	<b>Folding:</b> inappropriate. <b>Other:</b> can combine with mowing.	<b>Frequency:</b> at most once a year. <b>Seasonality:</b> mow after end of breeding bird nesting season. <b>Fertiliser:</b> no fertilisation. <b>Other:</b> can be followed by grazing.		Significant issue with <b>invasive tree species</b> black locust ( <i>Robinia pseudoacacia</i> ) and Russian olive ( <i>Eleagnus angustifolia</i> ).	(Valachovic et al, 2007) (Illyés and Csatho, 2007) (SOPSR, 2012)
6260 Pannonic sand steppes  f	<b>Intensity:</b> moderate to extensive. For closed dunes, 1 sheep/ha for 2 days/year recommended. To maintain shifting dune system, initial overgrazing by goats, or sometimes sheep, should be used. <b>Stock type:</b> sheep mostly used on closed dunes. Cattle on sand plains. Mixed sheep/goats can be used where succession is a problem. <b>Regime:</b> rotational grazing appropriate for cattle on sand plain. <b>Folding:</b> inappropriate on all subtypes.	Mowing is used less commonly than grazing. Nearly impossible on sand steppe; more typically used for closed steppes. <b>Seasonality:</b> begin after end of bird breeding season and plant seed-setting. No mowing in dry years. <b>Frequency:</b> mow once a year. <b>Regime:</b> leave at least 15% uncut and rotate uncut area each year. Cut to approx. 10cm.		In some areas, objective is succession and non-intervention is appropriate. Otherwise, active management needed every 5 years at least. Control of <b>invasive species</b> may be necessary through clearing and subsequent grazing, eg <i>Robinia</i> trees.	(ŠeffEROVÁ et al, 2008b) (Valachovic et al, 2007) (SOPSR, 2012)
6270 Fennoscandian lowland species-rich dry to mesic grasslands  f	Requires low intensity or extensive management by grazing or mowing – grazing is usually preferable for invertebrates but management must be adapted to site history. <b>Intensity:</b>	<b>Fertiliser:</b> no fertilisation. <b>Scrub:</b> some limited clearance may be appropriate, but intensive clearing in a short period of time is detrimental to biodiversity as the nutrient level in the soil increase when			(Pihlgren and Lennartsson, 2008) (Ikonen, 2011) (Beaufoy et al, 2011)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<p>low/moderate extensive. <b>Regime:</b> rotational grazing appropriate. <b>Seasonality:</b> delaying grazing until end of growing season beneficial for biodiversity, except on sites dominated by bracken where it may help break up dense stands. Appropriate management varies depending on the climate and history of the site. <b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation status.</p>	<p>the roots are decaying.</p>			
<p>6280 Nordic alvar and precambrian calcareous flatrocks  f</p>	<p><b>Intensity:</b> Generally extensive grazing but significant variation between sites; balance and adjust grazing pressure on site-specific basis. Guideline of one LU per 5–6 hectares. <b>Seasonality:</b> no grazing in winter. <b>Stock type:</b> consider mix on a site-by-site basis. Generally best suited to hardy breeds of</p>	<p><b>Scrub:</b> regular clearing may be necessary. Cleared material should be removed (or occasionally, burned). Never clear during bird breeding season. <b>Fertiliser:</b> fertilisers and biocides should not be used.</p>	<p>Drainage should be prevented.</p>	<p>Restrict establishment of <b>lime and gravel pits</b> on surrounding land. In some circumstances carefully controlled <b>burning</b> in winter or early spring can sometimes be appropriate to clear scrub.</p>	<p>(Eriksson and Rosén, 2008) (Beaufoy et al, 2011) (Lotman, 2004)</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	beef cattle, horses and/or sheep. <b>Supplementary feeding:</b> should not be used. <b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates.				
62A0 Eastern sub-Mediterranean dry grasslands ( <i>Scorzoneratalia villosae</i> ) f	<b>Intensity:</b> extensive grazing, sufficient to prevent invasion by tall herbs such as <i>Peucedanum cervaria</i> .	Mowing 1/2 times per year. <b>Fertiliser:</b> no fertilisation. <b>Scrub:</b> Regular cutting of trees and shrubs (eg <i>Cottinus coggygria</i> ) is necessary.			(EEA, 2011; Kaligarić et al, 2003)
6310 Dehesas with evergreen <i>Quercus</i> species f	<b>Stock type:</b> sheep, as cattle grazing can damage soil structure. Max threshold of 0.25 LU/ha.	Promote variation in understorey vegetation by maintaining some scrub (reptiles benefit), but maintain sufficient fire breaks. Traditional management included small patches of ploughing to sow cereals or to remove shrubs to favour herb growth.		Need to promote the <b>regeneration of tree populations</b> , can be by cycles of abandonment and opening of land. <b>Fire prevention and management</b> measures. Management needs to balance demands of the range of users including grazing, hunting, gathering, bee-keeping, recreation etc.	(VV.AA, 2009) (ICNB, 2006) (INPN, 2011) (Bergmeier et al, 2012) (Pereira and da Fonseca, 2003) (Surová et al, 2011) (Godinho et al, 2011) (Tárrega et al, 2000) (Martín & Lopez, 2002) (Fabbio et al, 2003)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
<p>6410 <i>Molinia</i> meadows on calcareous, peaty or clayey-silt laden soils (Molinion caeruleae)</p> <p>f</p>	<p>It would be favourable if a larger proportion of <i>Molinia</i> meadows were mown rather than grazed, but grazing can also be a suitable management form. Local traditional management regimes can be used as a guide.</p> <p><b>Intensity:</b> extensive to moderate, but grazing levels need to be adapted to each site, or even varied within a site, in order to benefit different priority plant species; eg <i>Liparis loeselii</i> requires very extensive grazing whereas <i>Sanguisorba officinalis</i>, the host plant of the <i>Phengaris</i> butterfly species, requires more intensive grazing.</p> <p><b>Fencing:</b> As livestock do not prefer <i>Molinia</i>, they should be prevented from grazing on other habitats, otherwise habitat will overgrow.</p> <p><b>Sheep folding:</b> inappropriate.</p> <p><b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will</p>	<p><b>Frequency:</b> low-intensity; one cut a year. Generally late (September), but in some areas cut was traditionally earlier (though still at end of breeding bird nesting season) and late cutting may not prevent eutrophication. Rotational or staggered management at the landscape scale allows animal species to find refuges from cutting on any one patch, and also allows species that benefit from earlier or later cuts to co-exist. It is valuable if a rotating 30% of the area can be unmown.</p> <p><b>Fertiliser:</b> no fertilisation is recommended. If fertilizer is used according to national recommendations, farmyard manure is preferable due to slow nutrient release and micro-nutrient content.</p>	<p>Very sensitive to water table changes and requires winter flooding. Typically, water tables should be raised by halting groundwater abstraction or, where this is not viable, by restricting the volume and the times at which water can be removed.</p>	<p>Maintain <b>spatial heterogeneity</b> to provide for needs of different taxa. Measures to reduce nutrient levels from atmospheric <b>eutrophication</b> may be necessary, such as topsoil burial, sod cutting or periodic intensive cutting or grazing. At lake shores it is important that the animals can move into the water, thus creating reed-free areas at shallow water where rare plants can thrive and birds can feed.</p>	<p>(INPN, 2011) (VV.AA, 2009) (Muller, 2002) (Bragazza, 2009) (Cop et al, 2009) (WallisDeVries et al, 2002) (Valachovic et al, 2007) (Crofts &amp; Jefferson, 1999) (Muller, 2002) (Søgaard et al, 2007) (Lotman, 2004) (BfN, 2011) (Valachovic et al, 2007)</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	negatively affect conservation status.				
6420 Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion  <b>p</b>	<b>Intensity:</b> low, avoid overstocking. <b>Stock type:</b> sheep or cattle.	Mowing can help maintain a mosaic structure, favouring key herbaceous plants. <b>Timing:</b> dates of cutting best defined locally. <b>Scrub:</b> remove plantation pine in wet depressions. Cutting of scrub may be necessary. <b>Fertiliser:</b> manure fertilisation should be limited by grazing sheep at low densities after mowing.	Changes to groundwater levels should be avoided. Typically, water tables should be raised by halting groundwater abstraction or, where this is not viable, by restricting the volume and the times at which it water can be removed.	<b>Fencing</b> may be necessary to prevent trampling by wild boar.  In some circumstances carefully controlled traditional winter <b>burning</b> regime may be beneficial (eg France); however, too frequent use can lead to colonisation by fire-tolerant plant species.	(VV.AA, 2009) (INPN, 2011) (ICNB, 2006) (Sarbu et al, 2004)
6430 Hydrophilous tall herb fringe communities of plain and of the montane to alpine levels  <b>p/n</b>	Only secondary habitats where disturbance through floods and/or landslides or avalanches does not prevent succession. Historically unmanaged habitats eg cliff ledges are a refuge for grazing sensitive plants and should not be grazed. Because of diversity of habitat types, management must be locally adapted. <b>Intensity:</b> extensive, together with associated grassland habitats.	Because of diversity of habitat types, management must be locally adapted. Occasional cutting to stop succession. <b>Timing:</b> every two or three years. Control of invasive species may require more intervention.	Water quality and water/ groundwater/ snow/ ice dynamics are key influencing factor	Regular disturbance through natural events is characteristic of habitat, and will be affected by river regulation & embankment, avalanche barriers etc.	(INPN, 2011) (VV.AA, 2009) (ICNB, 2006) (JNCC, 2007a) (VV.AA, 2009)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
6440 Alluvial meadows of river valleys of the <i>Cnidion dubii</i>  f	Control of access, duration and intensity are important. <b>Intensity:</b> low, particularly in wet season; high stocking levels have major impact on above and below-ground biomass <b>Seasonality:</b> no grazing in late wet or early dry season. Light grazing in wet season to avoid drowning grasses. After flooding, livestock off floodplains until they dry. <b>Folding:</b> inappropriate.	<b>Frequency:</b> <b>Type d)</b> depends on bi-annual mowing. In case of <b>other sub-types</b> , 1–2 times per year. <b>Seasonality:</b> Early mowing could improve forage quality and integrate easily into farming systems. But later mowing necessary to avoid bird nesting season and plant seed-setting. <b>Regime:</b> Leave stubble >8mm high. <b>Treatment of cuttings:</b> remove fresh and dry biomass. <b>Method:</b> light mowing equipment. <b>Fertiliser:</b> Determine correct levels <sup>96</sup> .	<b>Type d)</b> depends on spring floods. Species composition in <b>subtype a)</b> depends on duration/ timing of floods. River regulation should be prevented. Spring floods should only be allowed until end of April. Area should not be flooded for more than 10 days.		(INPN, 2011) (Šeffer et al, 2008) (Valachovic et al, 2007) (SOPSR, 2012) (BfN, 2011)
6450 Northern boreal alluvial meadows  f	Not possible to give any general recommendations; decision to be made on a site-by-site basis.	If the habitat is locally dependent on traditional management, mowing is usually crucial. In Scandinavia large areas with 6450 are however kept open by natural disturbances, and not	Depends on site. Restore natural spring flooding regime. Damming where possible to keep site inundated in winter,	Destruction of <b>natural hydrological regime</b> may restrict restoration/management. If possible the water regime of regulated rivers should follow the natural fluctuations.	(Eriksson, 2008a)

<sup>96</sup> Květ et al. (1996) found that fertiliser doses higher than 90 kg of nitrogen coupled with corresponding doses of phosphorus and potassium strongly reduced the number of species in the alluvial meadow community: the strongest reduction was recorded when using 400 kg of nitrogen per hectare. This led to a 40% loss in species diversity (Šeffer et al, 2008).

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
		<p>dependent on recurring management.</p> <p><b>Method:</b> scything is preferable but labour intensive and expensive; supplement with machinery. Cut to 10–15 cm.</p> <p><b>Seasonality:</b> After end of breeding bird nesting season. In Northern Sweden, mowing not carried out before mid-July.</p> <p><b>Treatment of cuttings:</b> essential to remove.</p> <p><b>Scrub:</b> should be regularly removed.</p>	<p>at a suitable depth to prevent bottom-freezing. Meadow should dry for 2–3 weeks before mowing<sup>97</sup>.</p>		
<p>6510 Lowland hay meadows</p> <p><b>f</b></p>	<p>Management should be adapted to local conditions, meadow vegetation subtype and historic management.</p> <p><b>Intensity:</b> low (sensitive to overgrazing by cattle).</p> <p><b>Regime:</b> after hay cutting. Grazing for a short period in spring may improve the germination rate for some spring-germinating plants by creating small patches with open soil.</p>	<p><b>Seasonality:</b> no cut before mid-June to allow bird nesting and plant seed-setting.</p> <p><b>Timing:</b> Rotational or staggered management at the landscape scale allows animal species to find refuges from cutting on any one patch, and also allows species that benefit from earlier or later cuts to co-exist. A rotating 30% of the area</p>		<p><b>Intensification</b> reduces species richness but moderately intensive management of some meadow types is acceptable.</p>	<p>(VV.AA, 2009) (Muller, 2002) (ICNB, 2006) (Cop et al, 2009) (INPN, 2011) (Zechmeister et al, 2003) (Carlin et al, 2010) (Crofts &amp; Jefferson, 1999) (Muller, 2002) (BfN, 2011; Cizek et al, 2012)</p>

<sup>97</sup> It is sometimes recommended to flood the site again after mowing, in late summer, to create good foraging conditions for ducks. However, stubble must not be drowned, reducing risk of die off.

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	<p><b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation status.</p>	<p>should be left unmown.  <b>Fertiliser:</b> normally no fertilization, especially not in areas that have not been fertilized previously. In northern Europe all fertilization is considered as negative for habitat quality. In eastern Europe some meadows have historically received small amounts of manure, but this should be carefully planned based on historical management and vegetation subtype. Other fertilisers and slurry must be avoided.  <b>Other:</b> mowing should control Marsh horsetail (<i>Equisetum palustre</i>).</p>			
6520 Mountain hay meadows  f	<p><b>Stock type:</b> traditional livestock preferable.  <b>Seasonality:</b> in spring and autumn; preferably sheep in spring and cattle in autumn.  <b>Regime:</b> alternation of mowing and grazing possible.</p>	<p><b>Frequency:</b> one cut per year, except for some mesophile subtypes which can be mown 2–3 times annually. Rotational or staggered management at the landscape scale allows animal species to find refuges from cutting on any one patch, and also allows species that benefit from earlier or later cuts to co-exist. A rotating</p>		<p>Regulate and control <b>tourism</b> impacts eg through signposting, fencing and path management. Prevention and control of <b>invasive species</b> may be necessary.  <b>Wild boar</b> populations may need to be controlled (eg Spain).</p>	<p>(INPN, 2011)  (Muller, 2002)  (Jefferson, 2005)  (VV.AA, 2009)  (Sarbu et al, 2004)  (Cop et al, 2009)  (Baur et al, 2006)  (Crofts &amp; Jefferson, 1999)  (Dolek and Geyer, 1997)  (Jefferson, 2005)</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
		<p>30% of the area should be left unmown.</p> <p><b>Fertiliser:</b> normally no fertilization, especially not in areas that have not been fertilized previously. Some meadows can tolerate occasional low amounts of manure, but this should be carefully planned based on historical management and vegetation type. Other fertilisers and slurry must be avoided.</p>			(Muller, 2002) (BfN, 2011) (Valachovic et al, 2007)
6530 Fennoscandian wooded meadows  f	<p>Differs according to traditional management.</p> <p><b>Regime:</b> can be used in combination with mowing, or in place of mowing. Normally after harvest.</p> <p><b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. <b>Supplementary feeding</b> of livestock will negatively affect conservation status.</p>	<p>Differs according to traditional management.</p> <p>Late mowing once a year, normally not before end of June, though depending on the climate and tradition.</p> <p>Removal of fallen twigs and leaves in spring.</p> <p><b>Scrub:</b> removal of shrub overgrowth where necessary.</p> <p><b>Method:</b> often by hand.</p> <p><b>Fertiliser:</b> normally no fertilisation.</p>		<p><b>Pollarding/coppicing</b> trees according to traditional management (in Estonia, trees were shredded or coppiced; in Sweden they were generally pollarded).</p>	<p>(Kukk and Kull, 1997)</p> <p>(Losvik and Hjelle, 2010)</p> <p>(EEA, 2009)</p> <p>(Bergmeier et al, 2012; Daugavpils Universitate, 2011)</p> <p>(Lotman, 2004)</p> <p>(Vassilev et al, 2011)</p>

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
<b>RAISED BOGS AND MIRES AND FENS</b>					
7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>  <b>p/n</b>	Primary habitat types do not require management and dependence on grazing varies from region to region. <b>Intensity:</b> low, extensive (as alternative to mowing). Care needed to minimize unwanted effects of foraging and trampling, particularly on priority species. <b>Stock type:</b> hardy equines eg Konik Polski horses or cattle eg Highland cattle.	Primary habitat types do not require management and dependence on mowing varies from region to region. <b>Frequency:</b> one cut per year. <b>Fertiliser:</b> none, or only very limited manure application (<30 kg N, <7 kg P and <50 kg K /ha /year).			(Muller, 2002) (VV.AA, 2009) (INPN, 2011) (National Parks and Wildlife Service, 2008) (Halada et al, 2011) (Muller, 2002) (Stammel et al, 2003) (BfN, 2011)
7230 Alkaline fens  <b>p</b>	Mowing is generally preferable, but grazing may be suitable in sites with shallow peat or where traditional grazing has been carried out for 50 years or more such that the species composition is adapted to the trampling disturbance. <b>Intensity:</b> should be carefully determined on site-by-site basis. In France, 0.2–0.8 livestock unit/ha recommended <b>Stock type:</b> cattle preferable to sheep. Traditional, hardy breeds preferable. <b>Regime:</b> rotational grazing	<b>Frequency:</b> mowing every second year or at 3-5 year intervals is sufficient for very wet calcareous fens and low-productivity alkaline fens dominated by mosses. <b>Cuttings</b> should be removed or burned in portable incinerator. <b>Equipment:</b> hand-mowing preferable, but only suitable on small scale. Use small light mowers or specially adapted tyres (low pressure twinned wheels). <b>Fertiliser:</b> no fertiliser use within habitat and restricted use in adjacent land.	Restoration will involve minimising fluctuations in water column and boosting groundwater levels to soil surface level eg by blocking/ infilling of ditches. Ditching etc must also be controlled in surrounding landscape. Knowledge of hydrological conditions is necessary for effective preservation of the	<b>Buffer zones</b> and other measures in the surroundings of the fen are necessary to reduce pressures from atmospheric and aquatic eutrophication.	(INPN, 2011) (VV.AA, 2009) (ŠeffEROVÁ et al, 2008c) (Broads Authority, 2011) (Carlin et al, 2010) (SØgaard et al, 2007) (BfN, 2011) (Valachovic et al, 2007)

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
	where possible. <b>Other:</b> grazing not suitable on calcareous fens; mowing should be used.	<b>Scrub:</b> at some sites, cutting scrub by hand may be only option, but only economic over small areas.	structure and function of fens.		
<b>ROCKY HABITATS</b>					
8230 Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii <b>p/n</b>	Only secondary habitat type needs grazing (habitat may be the result of overgrazing of acidic grassland). <b>Intensity:</b> very extensive <b>Type:</b> sheep and/or goats, cattle, also wild grazers eg chamois or ibex <b>Regime:</b> needs to be grazed together with the rest of the habitat mosaic of which it is part				(VV.AA, 2009) (Sohlman, 2007) (Ministerio dell'Ambiente e della Tutela del Territorio e del Mare, 2008) (Valachovic et al, 2007)
8240 Limestone pavement <b>p</b>	Varies between different subtypes <sup>98</sup> . <b>Intensity:</b> low: less than 1 ewe/ha (or cattle equivalent; 5 ewes = 1 cow). <b>Stock type:</b> cattle often preferable, at low grazing density. Traditional breeds beneficial.	<b>Scrub:</b> maintain/ reintroduce coppice and woodland management (thinning); control deer and fence coppice re-growth.		Control <b>invasive species.</b>	(INPN, 2011) (Cumbria Biodiversity Partnership, 2006) (JNCC, 2007a) (National Parks and Wildlife Service, 2008) (Valachovic et al, 2007)

<sup>98</sup> Open = restore by reducing stocking rate/ removing grazing animals. Wooded = maintain/ reintroduce coppice and woodland management (thinning); remove non-native species; control deer and fence coppice re-growth. Scrubby = remove non-native species where shade out other growth; consider coppice management.

Habitat and agricultural dependence	Management recommendations				References
	Grazing	Cutting or Mowing	Hydrological	Other	
<b>FORESTS</b>					
9070 Fennoscandian wooded pastures  f	<p>Grazing pressure must preserve a mosaic of habitats. <b>Intensity:</b> low (&lt;1.0 lu/ha); eg 0.2 cattle/ha.</p> <p><b>Stock type:</b> cattle, preferably older, hardier breeds.</p> <p><b>Regime:</b> year-round grazing closely reflects natural system; should be used where climate suited.</p> <p><b>Other:</b> use of animal medicines, particularly worm treatments, must be minimal to avoid affecting invertebrates. Supplementary feeding of livestock will negatively affect conservation status.</p>	<p><b>Regime:</b> mowing can be an additional measure to combat unwanted vegetation, but otherwise mowing is not part of the management practices.</p> <p><b>Scrub:</b> some removal may be necessary to re-open site for grazing, but some scrub should be maintained; open glades should not be too wide.</p> <p><b>Treatment of cuttings:</b> Do not remove dead or decaying wood. Material from scrub and tree thinning can be used to increase dead wood habitat.</p>		<p>Restoration may be necessary to re-open a site to grazing. Remove invasive tree species.</p> <p><b>Tree management:</b> Maintain clear space around old trees, pollard carefully.</p>	<p>(Eriksson, 2008b) (Beaufoy et al, 2011) (Bergmeier et al, 2012) (Lotman, 2004)</p>

## References

- AOPK CR (2007) Czech Republic Biomonitoring - Red Book on Habitats and Species of the Czech Republic. Ministerstvo životního prostředí České republiky <http://www.biomonitoring.cz/hp.php>
- Backshall, J, Manley, J and Rebane, M (eds) (2001) *The Upland Management Handbook*. English Nature, Peterborough.
- Baranska, K, Chmielewski, P, Cwener, A, Kiaszewicz, K and Plucinski, P (2009) *Conservation and restoration of xerothermic grasslands in Poland: theory and practice*. Naturalists' Club Publishers, Poland.
- Barbaro, L, Dutoit, T and Cozic, P (2001) A six-year experimental restoration of biodiversity by shrub-clearing and grazing in calcareous grasslands of the French Prealps. *Biodiversity and Conservation*, No 10, (1) pp119-135.
- Batáry, P, Báldi, A and Erdos, S (2007a) Grassland versus non-grassland bird abundance and diversity in managed grasslands: local, landscape and regional scale effects. *Biodiversity and Conservation*, No 16, (4) pp871-881.
- Batáry, P, Báldi, A, Szél, G, Podlussány, A, Rozner, I and Erdos, S (2007b) Responses of grassland specialist and generalist beetles to management and landscape complexity. *Diversity and Distributions*, No 13, (2) pp196-202.
- Baur, B, Cremene, C, Groza, G, Rakosy, L, Schileyko, A A, Baur, A, Stoll, P and Erhardt, A (2006) Effects of abandonment of subalpine hay meadows on plant and invertebrate diversity in Transylvania, Romania. *Biological Conservation*, No 132, (2) pp261-273.
- Beaufoy, G, Jones, G, Kazakova, Y, McGurn, P, Poux, X and Stefanova, V (2011) *Permanent Pastures and Meadows under the CAP: the situation in 6 countries*. European Forum for Nature Conservation and Pastoralism (EFNCP) and the Grasslands Trust, Derwentside.
- Bensettiti, F and Trouvilliez, J (2009) *Rapport synthétique des résultats de la France sur l'état de conservation des habitats et des espèces conformément à l'article 17 de la directive habitats*. Rapport SPN 2009/12, MNHN - Département Ecologie et Gestion de la Biodiversité - Service du Patrimoine Naturel, Paris.
- Bergmeier, E, Petermann, J and Schröder, E (2012) Geobotanical survey of wood-pasture habitats in Europe: diversity, threats and conservation. *Biodiversity and Conservation*, No 19, (11) pp2995-3014.
- BfN (2011) Verzeichnis Der in Deutschland Vorkommenden Lebensraumtypen Des Europäischen Schutzgebietssystems NATURA 2000. Bundesamt fuer Naturschutz [http://www.bfn.de/0316\\_typ\\_lebensraum.html](http://www.bfn.de/0316_typ_lebensraum.html)

Bragazza, L (2009) Conservation priority of Italian Alpine habitats: a floristic approach based on potential distribution of vascular plant species. *Biodiversity and Conservation*, No 18, (11) pp2823-2835.

Broads Authority (2011) Wetland Harvest Project. <http://www.broads-authority.gov.uk/managing/land/fen/management/fen-harvester.html>

Calaciura, B and Spinelli, O (2008a) *Management of Natura 2000 Habitats: 5210 Arborescent matorral with Juniperus spp.* Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 10/24, European Commission, Brussels.

Calaciura, B and Spinelli, O (2008b) *Management of Natura 2000 Habitats: 6210 \*Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia).* Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 12/24, European Commission, Brussels.

Carlin, C, Finn, J A, Ó hUallacháin, D and Gormally, M (2010) *Overview of methods to create and enhance farmland habitats in Ireland.* Teagasc; NUI Galway, Galway.

Ceulemans, T, Merckx, R, Hens, M and Honnay, O (2011) A trait-based analysis of the role of phosphorus vs nitrogen enrichment in plant species loss across North-west European grasslands. *Journal of Applied Ecology*, No 48, (5) pp1155-1163.

Chytrý, M, Koci, M, Sumberová, K, Sadlo, J, Krahulec, F, Hajkova, P, Hajek, M, Hofmann, A, Blazkova, D, Kucera, T, Novak, J, Simonova, D, Tichy, L, Knollova, I, Otypkova, Z, Danihelka, J, Hajek, O, Kubosova, K, Karimova, K and Rozehnal, J (2007) *Vegetace České Republiky 1. Travinná a Kerícková Společenstva [Vegetation of the Czech Republic 1: Grassland and Heathland Vegetation].* Academia, Praha.

Cizek, O, Zamecnik, J, Tropek, R, Kocarek, P and Konvicka, M (2012) Diversification of mowing regime increases arthropods diversity in species-poor cultural hay meadows. *Journal of Insect Conservation*, No 16, (2) pp215-226.

Cooper, F, Stone, R E, McEvoy, P, Wilkins, T and Reid, N (2012) *The conservation status of juniper formations in Ireland.* Irish Wildlife Manuals No.63, National Parks and Wildlife Service, Department of Environment, Heritage and Local Government of Ireland, Dublin, Ireland.

Cop, J, Vidrih, M and Hacin, J (2009) Influence of cutting regime and fertilizer application on the botanical composition, yield and nutritive value of herbage of wet grasslands in Central Europe. *Grass and Forage Science*, No 64, (4) pp454-465.

Crofts, A and Jefferson, R G (eds) (1999) *The Lowland Grassland Management Handbook.* 2nd ed. English Nature and The Wildlife Trusts, Peterborough.

Cumbria Biodiversity Partnership (2006) *Cumbria Biodiversity Action Plan: Limestone Pavements.* Cumbria Biodiversity Partnership, Cumbria.

Daugavpils Universitate (2011) Eremita Meadows (LIFE Projects). [http://www.eremita-meadows.lv/par\\_projektu/uzdevumi\\_2\\_7MEN.html](http://www.eremita-meadows.lv/par_projektu/uzdevumi_2_7MEN.html)

DeGabriel, J L, Albon, S D, Fielding, D A, Riach, D J, Westaway, S and Irvine, R J (2011) The presence of sheep leads to increases in plant diversity and reductions in the impact of deer on heather. *Journal of Applied Ecology*, No 48, (5) pp1269-1277.

Dolek, M and Geyer, A (1997) Influence of management on butterflies of rare grassland ecosystems in Germany. *Journal of Insect Conservation*, No 1, (2) pp125-130.

Doody, J P (2008) *Management of Natura 2000 Habitats: 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 02/24, European Commission, Brussels.

EEA (2009) EIONET FORUM Article 17 - Reporting Under Habitats Directive: Data Sheets for Habitats and Species. European Environment Agency EIONET [http://forum.eionet.europa.eu/x\\_habitat-art17report/library/datasheets/](http://forum.eionet.europa.eu/x_habitat-art17report/library/datasheets/)

EEA (2011) EUNIS Biodiversity Database. European Environment Agency <http://eunis.eea.europa.eu/index.jsp>

Eriksson, M O G (2008a) *Management of Natura 2000 Habitats: 6450 Northern Boreal alluvial meadows*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 18/24, European Commission, Brussels.

Eriksson, M O G (2008b) *Management of Natura 2000 Habitats: 9070 Fennoscandian wooded pastures*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 21/24, European Commission, Brussels.

Eriksson, M O G and Rosén, E (2008) *Management of Natura 2000 Habitats: 6280 Nordic alvar and precambrian calcareous flatrocks*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 16/24, European Commission, Brussels.

Fabbio, G, Merlo, M and Tosi, V (2003) Silvicultural management in maintaining biodiversity and resistance of forests in Europe - the Mediterranean region. *Journal of Environmental Management*, No 67, pp67-76.

Fuller, W J, Seffer, J, Ozden, O, Sefferova, V, Dogan, O, Stritih, J and Kara, C (2011) *Technical assistance for management and protection of potential Natura 2000 sites in the northern part of Cyprus: Management Plan for Alagadi SEPA*. NIRAS, Nicosia.

Fuller, W J, Seffer, J, Cicek, B A, Ozden, O, Eroglu, G, Kara, C, Sefferova, V and Dogan, O (2010) *Technical assistance for management and protection of potential Natura 2000 sites in the northern part of Cyprus: Management plan for Karpaz SEPA*. NIRAS, Nicosia.

Galvnek, D and Jank, M (2008) *Management of Natura 2000 Habitats: 6230 Species-rich Nardus grasslands*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 14/24, European Commission, Brussels.

Garca, R R, Fraser, M D, Celaya, R, Ferreira, L M M, Garca, U and Osoro, K (2012) Grazing land management and biodiversity in the Atlantic European heathlands: a review. *Agroforestry Systems*, No DOI: 10.1007/s10457-012-9519-3,

Garca-Gonzalez, R (2008) *Management of Natura 2000 Habitats: 6170 Alpine and subalpine calcareous grasslands*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 11/24, European Commission, Brussels.

Godinho, S, Santos, A P and S-Sousa, P (2011) Montado management effects on the abundance and conservation of reptiles in Alentejo, Southern Portugal. *Agroforestry Systems*, No 82, (2) pp197-207.

Grootjans, A P, Geelen, H W T, Jansen, A J M and Lammerts, E J (2002) Restoration of coastal dune slacks in the Netherlands. *Hydrobiologia*, No 478, (1-3) pp181-203.

Hkova, A, Klaudivova, A and Sdlo, J (2004) *Zsady pee o nelesn biotopy v ramci soustavy NATURA 2000*. [management principles for Natura 2000 in Czech Republic]. PLANETA, Prague.

Halada, L, Evans, D, Romo, C and Petersen, J-E (2011) Which habitats of European importance depend on agricultural practices? *Biodiversity and Conservation*, No 20, (11) pp2365-2378.

Hampton, M (2008) *Management of Natura 2000 Habitats: 4010 Northern Atlantic wet heaths with Erica tetralix*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. European Commission, Brussels.

Harris, M P K, Allen, K A, McAllister, H A, Eyre, G, Le Duc, M G and Marrs, R H (2011) Factors affecting moorland plant communities and component species in relation to prescribed burning. *Journal of Applied Ecology*, No 48, (6) pp1411-1421.

Houston, J A (2008a) *Management of Natura 2000 Habitats: 2130 Fixed coastal dunes with herbaceous vegetation ("grey dunes")*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 04/24, European Commission, Brussels.

Houston, J A (2008b) *Management of Natura 2000 Habitats: 2190 Humid dune slacks*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 05/24, European Commission, Brussels.

Hughes, H (2008) *Core Management Plan including Conservation Objectives for Eryri SAC*. M Willis (ed), Countryside Council for Wales, Bangor.

ICNB (2006) *Plano Sectorial da Rede Natura 2000*. Instituto da Conservao da Natureza e da Biodiversidade, Lisbon, Portugal.

ICNB (2008) *Relatório Nacional de Implementação da Directiva Habitats*. Instituto da Conservação da Natureza e da Biodiversidade, Lisbon, Portugal.

Ikonen, I (2011) Rekijokilaakso River Valley: FI. [http://www.natura.org/natura2000management/fi\\_rekijokilaakso\\_river\\_valley.html](http://www.natura.org/natura2000management/fi_rekijokilaakso_river_valley.html)

Illyés, E and Csatho, G J E A I (2007) Nature conservation actions and strategies for the preservation of rock steppes, loess steppes and wooded steppe meadows, in *Slope Steppes, Loess Steppes and Forest Steppe Meadows in Hungary*, pp214-219.

INPN (2011) Le Portail Du Réseau Natura 2000: Liste Des Habitats Pour Natura 2000 (132 Habitats). Inventaire National du Patrimoine Naturel <http://inpn.mnhn.fr/site/%20natura2000/listeHabitats>

Jefferson, R G (2005) The conservation management of upland hay meadows in Britain: a review. *Grass and Forage Science*, No 60, (322) 331.

JNCC (2007a) *Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006*. Joint Nature Conservation Committee, Peterborough, UK.

JNCC (2007b) *Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006*. Joint Nature Conservation Committee, Peterborough, UK.

Kaligaric, M, Seliškar, A and Veen, P (2003) *Grasslands of Slovenia. Status and Conservation of Semi-Natural Grasslands*. Society for Natural History in Slovenia and Royal Dutch Society for Nature Conservation.

Kukk, T and Kull, K (1997) Wooded Meadows: Summary, in *Wooded Meadows*, pp138-146. Estonia Maritima, Estonia.

Losvik, M H and Hjelle, K (2010) Wooded Hay Meadows in Norway. [http://pan.cultland.org/cultbase/?document\\_id=132](http://pan.cultland.org/cultbase/?document_id=132)

Lotman, A (2004) *Management of coastal habitats and grasslands*. Background paper for the LIFE-Nature Co-op project "Experience exchange on habitat management among Baltic LIFE-Nature projects". Baltic Environmental Forum, Matsalu.

Martín, J and Lopez, P (2002) The effect of Mediterranean dehesa management on lizard distribution and conservation. *Biological Conservation*, No 108, pp213-219.

McCorry, M and Ryle, T (2009) *Saltmarsh monitoring project 2007-2008: final report*. A report for Research Branch, National Parks and Wildlife Service, National Parks and Wildlife Service, Ireland.

Ministerie van Economische Zaken, Landbouw en Innovatie (2012) *Natura 2000 in the Netherlands: Habitat Types and Species*. Ministerie van Economische Zaken, Landbouw en Innovatie <http://www.synbiosys.alterra.nl/natura2000/default.aspx?main=home>

Ministerio dell'Ambiente e della Tutela del Territorio e del Mare (2008) *Attuazione della Direttiva Habitat e Stato di Conservazione di Habitat e Spezie in Italia*. Ministero dell'Ambiente e della Tutela del Territorio e del Mare, Rome, Italy.

Muller, S (2002) Appropriate agricultural management practices required to ensure conservation and biodiversity of environmentally sensitive grassland sites designated under Natura 2000. *Agriculture, Ecosystems & Environment*, No 89, (3) pp261-266.

National Parks and Wildlife Service (2008) *The status of EU protected habitats and species in Ireland*. National Parks and Wildlife Service, Dublin, Ireland.

Newton, A C, Stewart, G B, Myers, G, Diaz, A, Lake, S, Bullock, J M and Pullin, A S (2009) Impacts of grazing on lowland heathland in north-west Europe. *Biological Conservation*, No 142, (5) pp935-947.

Papanastasis, V P, Kyriakakis, S and Kazakis, G (2002) Plant diversity in relation to overgrazing and burning in mountain mediterranean ecosystems. *Journal of Mediterranean Ecology*, No 3, (2-3) pp53-63.

Papanikolaou, A D, Fyllas, N M, Mazaris, A D, Dimitrakopoulos, P G, Kallimanis, A S and Pantis, J D (2011) Grazing effects on plant functional group diversity in Mediterranean shrublands. *Biodiversity and Conservation*, No 20, (12) pp2831-2843.

Pereira, P M and da Fonseca, M P (2003) Nature vs. nurture: the making of the montado ecosystem. *Conservation Ecology*, No 7, (3) 7.

Picchi, S (2008) *Management of Natura 2000 Habitats: 2250 Coastal dunes with Juniperus spp.* Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 06/24, European Commission, Brussels.

Pihl, S, Ejrnaes, R, Sjøgaard, B, Nielsen, K E, Dahl, K and Laursen, J S (2001) *Habitats and species covered by the EEC Habitats directive: a preliminary assessment of distribution and conservation status in Denmark*. NERI Technical Report No 365, Ministry of Environment and Energy, National Environmental Research Institute, Denmark.

Pihlgren, A and Lennartsson, T (2008) Shrub effects on herbs and grasses in semi-natural grasslands: positive, negative or neutral relationships? *Grass and Forage Science*, No 63, (1) pp9-21.

Poschlod, P and WallisDeVries, M F (2002) The historical and socioeconomic perspective of calcareous grasslands - lessons from the distant and recent past. *Biodiversity Conservation*, No 104, (3) pp361-376.

Ramón Vallejo, V, Arianoutsou, M and Moreira, F (2012) Fire Ecology and Post-Fire Restoration Approaches in Southern European Forest Types, in F Moreira, M Arianoutsou, P Corona, & J De las Heras (eds) *Post-Fire Management and Restoration of Southern European Forests*, Springer,

Rannap, R, Briggs, L, Lotman, K, Lepik, I and Rannap, V (2004) *Coastal Meadow Management - Best Practice Guidelines*. The experiences of LIFE-Nature project "Boreal Baltic Coastal Meadow Preservation in Estonia" LIFE00NAT/EE/7083. Ministry of the Environment of the Republic of Estonia, Tallinn.

Riksen, M, Ketner-Oostra, R, Van Turnhout, C, Nijssen, M, Goossens, D, Jungerius, P D and Spaan, W (2006) Will we lose the last active inland drift sands of Western Europe? The origin and development of the inland drift-sand ecotype in the Netherlands. *Landscape Ecology*, No 21, (3) pp431-447.

RSPB (2012) MACHAIR LIFE+ Conserving Scottish Machair. Conserving Scottish Machair LIFE+ <http://www.machairlife.org.uk/index.php?/home/why>

San Miguel, A (2008) *Management of Natura 2000 Habitats: 6220 Pseudo-steppe with grasses and annuals (Thero-Brachypodietea)*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 13/24, European Commission, Brussels.

Sarbu, A, Gheorghe, C, Gavril, N, Vasile, C, Hanganu, J and Veen, P (2004) *Grasslands of Romania*. Final report on National Grasslands Inventory 2000-2003. University of Bucharest, Bucharest, Romania.

Šeffler, J, Janák, M and Šefflerová, S V (2008) *Management of Natura 2000 Habitats: 6440 Alluvial meadows of river valleys of the Cnidion dubii*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 17/24, European Commission, Brussels.

Šefflerová, S V, Janák, M and Ripka, J (2008a) *Management of Natura 2000 Habitats: 1530 \*Pannonic salt steppes and salt marshes*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 03/24, European Commission, Brussels.

Šefflerová, S V, Vajda, Z and Janák, M (2008b) *Management of Natura 2000 Habitats: 6260 \*Pannonic sand steppes*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 15/24, European Commission, Brussels.

Šefflerová, S V, Šeffler, J and Janák, M (2008c) *Management of Natura 2000 Habitats: 7230 Alkaline fens*. Technical Report 2008 20/24, European Commission, Brussels.

Søgaard, B, Skov, F, Ejrnaes, R, Pihl, S, Fredshavn, J R, Nielsen, K E, Clausen, P, Laursen, K, Bregnballe, T, Madsen, J, Baattrup-Pedersen, A, Søndergaard, M, Lauridsen, T L, Aude, E, Nygaard, B, Møller, P, Riis-Nielsen, T and Buttenschøn, R M (2007) *Criteria for favourable conservation status in Denmark*. Natural habitat types and species covered by the EEC Habitats Directive and birds covered by the EEC Birds Directive. NERI Technical Report No. 647, National Environmental Research Institute, University of Aarhus, Aarhus, Denmark.

Sohlman, A (2007) *Arter & Naturtyper i Habitatdirektivet - tillståndet i Sverige 2007*. Övriga medverkande se sid 73. Uppdragsgivare och ekonomiskt stöd: Naturvårdsverket, Stockholm, Sweden.

SOPSR (2012) Slovakia Natura 2000 Website. Štátna ochrana prírody SR <http://www.sopsr.sk/natura/index1.php?p=4&lang=en&sec=13>

Stammel, B, Kiehl, K and Pfadenhauer, J (2003) Alternative management on fens: Response of vegetation to grazing and mowing. *Applied Vegetation Science*, No 6, (2) pp245-254.

Surová, D, Surový, P, de Almeida Ribeiro, N and Pinto-Correira, T (2011) Integrating differentiated landscape preferences in a decision support model for the multifunctional management of the Montado. *Agroforestry Systems*, No 82, (2) pp225-237.

Tahmasebi Kohyani, P, Bossuyt, B, Bonte, D and Hoffmann, M (2008) Grazing as a management tool in dune grasslands: Evidence of soil and scale dependence of the effect of large herbivores on plant diversity. *Biological Conservation*, No 141, (6) pp1687-1694.

Tárrega, R, Calvo, L, Taboada, Á, García-Tejero, S and Macros, E (2000) Abandonment and management in Spanish dehesa systems: effects on soil features and plant species richness and composition. *Forest Ecology and Management*, No 257, pp731-738.

Tucker, G M (2003) *Review of the Impacts of Heather and Grassland Burning in the Uplands on Soils, Hydrology and Biodiversity*. 550, English Nature, Peterborough.

Valachovic, D, Galvánek, D, Stanová, V, Jarolímek, R, Hrivnák, R, Lasák, H, Otahelová, H and Šeffer, J (2007) *Management measures for the maintenance of a favourable conservation status of non-forest habitats of Annex I in the Natura 2000 sites*. Štátna ochrana prírody SR (State Nature Conservancy of the Slovak Republic), Banská Bystrica, Slovakia.

Vassilev, K, Pedashenko, H, Nikolov, S C, Apostolova, I and Dengler, J (2011) Effect of land abandonment on the vegetation of upland semi-natural grasslands in the Western Balkan Mts., Bulgaria. *Plant Biosystems*, No 145, (3) pp654-665.

VV.AA (2009) Bases Ecológicas Preliminares Para La Conservación De Los Tipos De Hábitat De Interés Comunitario En España. Ministerio de Medio Ambiente, y Medio Rural y Marino online resource [http://www.magrama.gob.es/es/biodiversidad/temas/red-natura-2000/documentos-claves-de-la-red-natura-2000/acceso\\_fichas2010-10-28\\_21.04.13.6872.aspx](http://www.magrama.gob.es/es/biodiversidad/temas/red-natura-2000/documentos-claves-de-la-red-natura-2000/acceso_fichas2010-10-28_21.04.13.6872.aspx)

WallisDeVries, M F, Poschlod, P and Willems, J H (2002) Challenges for the conservation of calcareous grasslands in northwestern Europe: integrating the requirements of flora and fauna. *Biological Conservation*, No 104, (3) pp265-273.

Willems, J H (2001) Problems, approaches and results in restoration of Dutch calcareous grassland during the last 30 years. *Restoration Ecology*, No 9, (2) pp147-154.

Zaghi, D (2008) *Management of Natura 2000 Habitats: 4060 Alpine and Boreal heaths*. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Technical Report 2008 09/24, European Commission, Brussels.

Zechmeister, H G, Schmitzberger, I, Steurer, B, Peterseil, J and Wrбка, T (2003) The influence of land-use practices and economics on plant species richness in meadows. *Biological Conservation*, No 114, (2) pp165-177.

Zingstra, H, Swart, W and Grigorova, Y (2010) *Model for Calculating Agri-environment Payments in Natura 2000 Sites*. Centre for Development Innovation, Wageningen.