



**Addressing biodiversity and habitat
preservation through Measures applied
under the Common Agricultural Policy**

***Executive Summary
In English and French***

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EXECUTIVE SUMMARY

Based on a thorough review of the relationship between agriculture and biodiversity, the purpose of this study is to consider how policies, particularly the Common Agricultural Policy (CAP), have worked in terms of their design, coordination and implementation for sustaining biodiversity and associated ecosystem services through agriculture, and how their role can be enhanced in the future to contribute towards meeting the EU's biodiversity goals. The interactions between forest management and biodiversity were out with the remit of this study. It considers the impacts and effectiveness of the current suite of policy measures, both within and outside the CAP, on delivering biodiversity benefits through agriculture and mitigating adverse agricultural impacts. Stepping back from a purely agricultural focus, the study also considers how biodiversity associated with farmland can be delivered alongside other economic and social priorities in rural areas. It concludes by discussing the policy developments needed, particularly within the CAP, to ensure that biodiversity associated with agriculture is delivered as a strategic priority.

The study uses the widely accepted definition of biodiversity, as set out by the Convention on Biological Diversity (CBD): 'biological diversity means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems'. Biodiversity, therefore, is understood as relating not just to species, but also to genetic diversity, habitats and ecosystems. The EU's headline target of halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, also concerns all these components. Furthermore, it is important to note that biodiversity conservation does not just focus on rare and threatened species and habitats listed in the Birds and Habitats Directives. The maintenance of populations of widespread and common species, including those of agriculture habitats is also a serious concern. Such species may not necessarily be protected by EU legislation, but underpin some ecosystem services, are regularly encountered, enjoyed and therefore valued by the EU public.

The evidence draws on a wide range of secondary sources, including scientific literature, evaluation studies, an in-depth analysis of the policy framework, along with detailed information collected from six case studies conducted in the Czech Republic, France, Germany, Greece, Romania and the UK.

The importance of sustaining biodiversity through agriculture

The importance and value of biodiversity for human well-being is recognised increasingly both in Europe and globally for its intrinsic and cultural worth, as well as its role in providing essential ecosystem services. Indeed, amongst the European public, there is widespread concern for the environment and biodiversity in particular.

The EU Biodiversity Strategy, adopted in 2011, stresses the importance of the agricultural sector in meeting the EU's headline biodiversity target. The Strategy includes a specific objective to 'maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU 2010 Baseline, thus contributing to enhance sustainable management'.

Agriculture covers about 40 per cent of the total land area of the EU-27 and its management has substantial impacts, both positive and negative, on the functioning of natural systems. Over time, agriculture has contributed to the creation of a rich diversity of habitats and landscapes, including semi-natural habitats of high biodiversity value. However, structural changes in agriculture in the second half of the twentieth century have led to increased intensification, concentration and specialisation of production in some areas and marginalisation and abandonment in others, leading to significant biodiversity losses across the farmed landscape. A number of drivers have encouraged these trends, including support under the CAP and exogenous drivers such as trends in agricultural commodity prices, changes in technology, trade agreements, and more recently climate change. These trends do not just impact upon farmland biodiversity, but also on the provision of several ecosystem services, such as water quality, soil health, and air quality.

Interactions between Agriculture and Biodiversity

The pattern of biodiversity found today in Europe is primarily a result of thousands of years of human interaction with the environment. As agriculture expanded in Europe, a variety of low-intensity traditional agricultural practices developed over time that were suited to the varying climates, topography and soils, creating in the process a rich diversity of farmland landscapes and new habitats. The novel species communities that developed initially probably increased species richness across much of Europe. Some of these semi-natural habitats, such as wood pastures, hay meadows, scrubland and heathlands, survive today, and continue to be managed by farmers and graziers. A key characteristic of many of these habitats is that natural succession is prevented by grazing, cutting of grass and, in certain parts of Europe, carefully controlled burning practices. Livestock farming and the associated low-intensity practices have played a significant role in this and their continuation is often crucial for their survival. Some of the natural non-forested habitats that developed after the last ice-age in Europe, such as tundra, blanket bogs, montane grasslands and salt-steppes, can be considered to be agricultural habitats as well as they are grazed to some extent, although they are generally not dependent on this for their continued existence.

However, the rapid changes in agricultural development over the past decades have led to significant productivity gains in the most fertile areas of the EU through processes of intensification, concentration and specialisation. This has created highly modified and simplified agricultural habitats and landscapes that are hostile to many wild plants and animals (for example as a result of frequent cultivations, the use of pesticides, fertiliser, and

the presence of highly competitive crop cultivars) and often no longer provide sufficient food resources for the species that could otherwise tolerate the changed conditions.

There is broad agreement within the scientific literature that the majority of species of high conservation importance are associated with semi-natural habitats and natural habitats. In general, biodiversity value (taken as the diversity of characteristic species and rare species) declines with increasing agricultural improvement, specialisation, concentration and intensification and the accompanying changes in practice required to increase efficiency.

The key factor that determines the level of biodiversity associated with agricultural habitats is therefore the degree to which they have been modified from their natural state as a result of grazing, one-off or occasional agricultural improvements (ie drainage, ploughing and reseeded) and/or routine intensification or modernisation of management, such as cultivations, the use of fertilisers, irrigation and pesticides etc. It is important to note that highly productive farming systems within modified and intensive croplands and temporary grasslands do retain some widespread and adaptable species, particularly birds, although they have low species diversity and support very few invertebrates, plants, birds or other fauna of high conservation importance. Because these are often the last visible vestiges of nature in many farmland landscapes they are particularly appreciated by the wider public and consequently have high cultural values.

Through an analysis of monitoring data specifically related to agricultural habitats, this study reaffirms the findings in the EEA's 2010 Biodiversity Baseline report that a particularly low proportion of agricultural habitats have a favourable conservation status. Monitoring data on the status of Annex I habitats under the Habitats Directive demonstrates that considerable improvement in the condition of these habitats is needed if the aims of the Habitats Directive are to be met. Recent research identified 63 habitats (out of 231 listed in Annex 1) that are dependent on agriculture to some extent, 25 of which are considered to be fully dependent on agricultural activities and are therefore particularly sensitive to agricultural abandonment.

Monitoring data on birds and butterflies in recent decades also provide evidence of substantial declines in species populations and species richness, particularly in improved grassland and intensively cultivated habitats. Such declines are now increasingly consistent across all EU countries, although declines have been greatest in the EU-15. As a result, common farmland bird populations have declined by 20 per cent since 1990, and by approximately 50 per cent since 1980, although these pre-1990 trends are less certain. There is some indication that the rate of decline may have levelled off, but scarce farmland birds (including those of extensive cereal systems and permanent crops) of high conservation importance continue to decline. Butterfly data seem to indicate steeper declines, especially amongst semi-natural grassland species. European-wide monitoring data on plants and other taxa groups are not available, but various national studies consistently show very high rates of decline in species diversity in improved grassland and intensively cultivated farmland habitats.

As a framework for this study, a field scale typology of agricultural habitats was developed according to their relative biodiversity value, which identifies the type of vegetation

associated with each habitat, the number of priority habitats and species (as classified under the Birds and Habitats Directives) associated with them as well as the principal management needs for each habitat in terms of fairly specific agricultural practices. The typology distinguishes between permanent grasslands grazed by livestock and other forms of natural or semi-natural vegetation; improved grasslands; cultivated croplands, including temporary grassland; and permanent crops. The framework is also used to illustrate the potential for maintaining and enhancing biodiversity through agriculture, as well as the range of agricultural practices that can sustain biodiversity in each particular type of habitat.

The potential for agricultural practices to maintain and enhance biodiversity differs amongst habitats, primarily depending on their biodiversity value. Natural habitats are generally not dependent on grazing, and many are sensitive to grazing levels. The main priority for such habitats is therefore to ensure that if grazing occurs it is appropriate. In contrast many semi-natural habitats, are highly dependent on the continuation of a number of beneficial agricultural practices (such as extensive grazing with appropriate livestock, traditional haymaking and traditional agro-forestry), which may be lost through either intensification or abandonment. Extensive agricultural management can also contribute to the restoration of rare and fragmented semi-natural habitats, which is a priority in some areas. In agriculturally improved/intensive habitats, the priority is to modify farming practices to avoid, or reduce to acceptable levels, impacts on important non-agricultural habitats such as wetlands (eg through buffer strips to reduce the run-off); to maintain unfarmed features such as hedges, fallow areas, patches of scrub, trees, ditches and ponds, which act as foraging and breeding sites and help to create ecological connectivity in fragmented farmland landscapes. Mixed farming systems and the use of crop rotations (especially with fallow land) within arable systems also help to maintain landscape-scale diversity, which is important in semi-natural and more intensively farmed landscapes.

Future trends in agricultural re-structuring are likely to have mixed implications for biodiversity and further biodiversity losses are likely to occur. Further intensification is likely to exert greatest pressures on the EU-12 Member States, because there is considerable scope for further farm investment, restructuring and technological improvement in the region. This will have substantial biodiversity impacts as many of Europe's most threatened agricultural habitats and species remain in these regions, mainly as a result of their lower intensity farming. In addition, significant areas of semi-natural habitats and other High Nature Value farmland are expected to be especially vulnerable to much reduced management and land abandonment (especially in more marginal areas), which will generally have detrimental impacts where large proportions of the landscape are affected.

The effectiveness of policies and measures promoting biodiversity through agriculture

The CAP is the most important funding instrument at the EU level with potential to deliver biodiversity associated with agriculture at a European scale given that it influences the management of the majority of agricultural land. Maintaining, enhancing and restoring biodiversity has been one of the key priorities to be addressed by environmental measures within the CAP since they were introduced in the 1980s/1990s, with the main focus being on measures to influence land management practices. The agri-environment measure

continues to be the most significant one in this regard, both in terms of the financial resources allocated to it and its spatial coverage. Under Pillar 1, cross-compliance is the main measure currently to have biodiversity as an objective. However, a whole range of other CAP measures can also be used to deliver biodiversity, both within Pillar 1 and Pillar 2. Environmental legislation evidently also plays a key role, for example the requirements of the Birds and Habitats Directives, including the creation of the Natura 2000 network. Other EU environmental legislation, such as the Water Framework Directive and the Nitrates Directive also can help to protect and enrich agricultural biodiversity, for example by reducing the use of fertilisers and pesticides, with beneficial knock-on effects on species and habitats.

While real progress has been made in recent years with efforts to reverse the declines in agricultural biodiversity in the EU, the pressures facing biodiversity are such that this has been insufficient to meet the targets that were set for 2010. There are a range of reasons why this is the case. However, it is clear that the current policy framework provides a good foundation on which to build to make the changes needed if the new 2020 biodiversity targets and the related agricultural targets under the new Biodiversity Strategy are to be met in the next eight years. To this end, as part of the current reform of the CAP, the Commission is proposing to enhance its contribution to biodiversity by introducing new compulsory environmental measures linked to direct payments within Pillar 1.

With respect to the current CAP, the following measures are of particular importance for the delivery of biodiversity policy goals:

Agri-Environment: As the only measure in Pillar 2 of the CAP that is compulsory for Member States to implement, the agri-environment measure is the primary policy measure used to encourage farmers to adopt management practices that are beneficial to biodiversity. One of the merits of the measure is its flexibility, which allows Member States to develop voluntary schemes that reflect different bio-physical, climatic, environmental and agronomic conditions to suit local conditions. A number of scientific studies have confirmed that as a whole, the biodiversity status of agricultural habitats subject to agri-environment measures is significantly better than would have been the case if the policy had not been in place. There is good evidence that well designed and implemented agri-environment measures have been critical in maintaining and restoring biodiversity in many areas.

In semi-natural habitats, the agri-environment measure has been used for highly targeted and tailored schemes for the conservation of threatened habitats and species (often being the key means of achieving appropriate management in Natura sites), as well as encouraging the maintenance of low intensity management on High Nature Value (HNV) farmland in the wider countryside. There are a number of examples of agri-environment schemes that have been successful in supporting HNV farming, thereby maintaining semi-natural wooded pasture habitats (Sweden, Estonia), hay-meadows and mountain pastures (Slovakia, Romania), the restoration of overgrazed pastures (Bulgaria), moorland grazing (the UK) and traditional agro-forestry systems in Spain ('dehesas'). Support for traditional local breeds, either through their use in management options within agri-environment schemes targeting the HNV farming, or through specific agri-environment schemes for genetic resources, has been essential for stemming their decline. Agri-environment schemes

targeting HNV farmland have not been beneficial just for biodiversity, but have also provided a range of other environmental benefits and supported ecosystem services. By making it possible for such systems to continue, agri-environment schemes indirectly support the ongoing contribution they make in the local economy, contributing to employment and providing a basis for diversification activities.

It is critical to use an effective combination of measures to deliver sustainable outcomes for biodiversity in semi-natural habitats, particularly in economically lagging areas. For example, in a variety of regions the agri-environment measure has been used in combination with several other CAP Pillar 2 land-based area payments to pursue biodiversity outcomes, for example the Natura 2000 payments and the compensation measure for 'less-favoured areas' (LFA payments). Other measures have also been shown to play an important role if used appropriately, for example those that provide support for farmer advice, training, information, and extension services; certain capital investments associated with farm modernisation, non-productive investments and the infrastructure measure; support to producers associations for quality products; diversification into non-agricultural business activities, and the participatory Leader approach.

Although the overall evidence is variable, it suggests that agri-environment measures have also proved successful in delivering benefits for widespread and common species in improved grasslands and intensive croplands. The benefits associated with agri-environment measures for intensive croplands are found mainly in instances where a combination of management options provide key ecological resources for vulnerable species, in particular breeding habitat and year-round food resources, as these tend to be reduced by agricultural intensification and specialisation. The main priority for most of the declining species of such habitats (especially birds), are measures that provide in-field resources (such as fallow patches or fields, over-wintered stubbles, diverse crops and crops with reduced pesticides). However, some species also benefit from field edge management measures, such as the planting of field margins with seed-rich or nectar-rich plants, or reductions in the use of pesticides in field headlands. Maintaining populations of common species has often proved to be more of a challenge due to the scale of response that is needed, but there have been some successes and recent initiatives are encouraging. A range of factors affect the outcomes of agri-environment schemes, a number of which are unrelated to policy or agricultural management. These include variations in climate and weather; the hunting or killing species inside and outside Europe; invasive alien species; predators, including large carnivores, such as bears and wolves; non-agricultural habitat loss taking place both inside and outside Europe that affects migratory species; and incompatible management taking place on neighbouring land.

Cross-compliance: Certain of the cross-compliance requirements now specified in the CAP are important for ensuring basic levels of management that can support biodiversity on farmland. By requiring a certain level of management to be carried out as a condition both for receipt of direct payments and for area based agricultural payments under Pillar 2, cross-compliance can help constrain the potential adverse impacts of both the intensification and marginalisation of agricultural habitats (through the standards of Good Agricultural and Environmental Condition – GAEC). The Statutory Management Requirements (SMRs) help to reinforce the application of environmental legislation. The evaluation of the impact of these

measures on biodiversity at a pan-European level is urgently needed, as many of these standards have been changed since 2005, or introduced more recently, and little current information exists on which an assessment of their effectiveness can be based.

Direct Payments: Direct payments themselves are not focussed directly on the delivery of biodiversity. However, they provide the basis for cross compliance requirements, and as a result of this link, direct payments can influence farmers' awareness and behaviour relating to certain biodiversity concerns. They play a role in stabilising farm incomes which in this context is particularly significant for those farms that are economically vulnerable and managing land that is important for biodiversity. As such, they provide a basis for more targeted measures under the second pillar. There is scope for targeting these payments more on environmental objectives in future, as the Commission is proposing.

Certain eligibility issues relating to the implementation of direct payments unintentionally have led to locally specific damage to biodiversity in some Member States. Because farmers are at real risk of losing direct payments when their land does not comply with the eligibility rules applied at national level, or with certain GAEC provisions, they are strongly motivated to change the management of their land to minimise this risk. In some instances, where cross compliance or eligibility issues are unclear or interpreted incorrectly, farmers have removed vegetation in semi-natural habitats for fear of being penalised. In other cases, environmentally beneficial habitats have been deemed ineligible for direct payments in particular regions, heightening the risk of land eventually being taken out of farming and abandoned. Therefore there is a widespread concern about the large areas of land which currently, for a variety of reasons, are not declared or not eligible for direct payments, which include some of the most extensive and ecologically valuable permanent pastures, including those listed under the Birds and Habitats Directive in Estonia, Bulgaria, Romania, Slovakia, Sweden, Spain, Scotland, Northern Ireland and France (alpine meadows).

More broadly there is a need to develop a coherent policy response to farmland biodiversity, where measures work synergistically and perverse effects are avoided. In particular, the development of appropriate mixes of widely applied generic measures and more targeted and tailored measures is essential for all policies to have their desired ecological impacts. However, measures also need to be sufficiently accessible and attractive to farmers to ensure adequate levels of uptake. Advice and information provision alongside training and the development of skills have therefore also been shown to be a key factor influencing the successful implementation of policy measures to deliver biodiversity outcomes in many regions. This is true for voluntary measures, such as agri-environment schemes, as well as for regulatory requirements and GAEC standards. Certain institutional and governance factors are also demonstrated to be important to help maximise the successful design and implementation of policy measures in practice.

They include having the appropriate administrative and technical resources and expertise in place in public authorities, including appropriately trained staff who understand the dynamic interactions between agriculture and the environment. Adequate databases, and suitable systems need to be in place to be able to target and monitor measures well, to deliver payments efficiently and to ensure effective control and enforcement. Finally, it is important to recognise that policy measures under the CAP do not operate in isolation.

They interact with a range of other policies. The use of biodiversity focussed measures in the CAP, therefore, needs to be identified as an integral part of broader national biodiversity strategies that identify the range of policy instruments to be used to meet biodiversity goals

Biodiversity in a sustainability perspective

The economic, political and environmental context within which measures to promote biodiversity oriented land management practices are operating is not static, and is influenced by a wide range of policy and non-policy drivers. Indeed, Europe's biodiversity goals must be met, while simultaneously addressing priorities for the broader economic, social and environmental sustainability of rural areas, including addressing new challenges such as climate change.

Different trends in the development of rural economies and rural communities exert a variety of pressures on biodiversity. In the past, policies stimulating economic growth in rural areas often have taken inadequate account of biodiversity and damage has occurred as a result. In considering the relationship between biodiversity and policy objectives for the socio-economic development of rural areas, for ensuring the viability and competitiveness of the agricultural sector and for achieving climate goals, there are clear opportunities for using biodiversity as an economic asset, as part of the solution for achieving sustainable development in rural areas.

In particular the 'green growth' agenda may offer opportunities to biodiversity both through the development of green technologies that can limit agriculture's impact on the environment, and also through wider economic initiatives, for example through sustainable tourism and on-farm biodiversity management activities etc. Adequate biodiversity protection also is essential for the provision of many ecosystem services which are needed to underpin economic activities. Perhaps more fundamentally biodiversity, especially with regard to healthy soils, is also critical for the long term productivity and sustainability of agriculture and will therefore play a key role in ensuring food security in the future.

However the degree to which these synergies can be built upon as part of future trajectories for the development of rural areas will vary in Europe. A typology of rural areas is used to help distinguish between the different opportunities, synergies and conflicts that may occur and how these might be maximised or prevented in different situations. This shows that areas which are lagging economically are of particular concern, for example areas where agriculture remains small-scale and unmodernised and which suffer from remoteness and declining populations. In these areas there is particular pressure for rural economies to develop and become more competitive while the implications for biodiversity can be particularly sensitive. Finding ways of achieving sustainable solutions for these areas is paramount. Indeed, the long-term sustainability (economic and social as well as environmental) of rural development pathways is a key concern for biodiversity and public policy, including the CAP's rural development policy, plays a key role in supporting this.

Opportunities do exist. For example, agriculture can be 'embedded' within a wider regional economy and community in ways which reinforce the direct economic value of biodiversity

as a feature of farming systems and practices, as is the case with organic farming, or high value-added products linked to farming practices which protect biodiversity in concrete ways, or eco-tourism or low-impact, sustainable leisure developments which celebrate and protect biodiversity.

The occurrence of 'win-win' situations where biodiversity is supported by sustainable rural development depends, to some extent, on the nature and extent of valued ecosystem services associated with farmland biodiversity. However, it also requires elements of human and social capital in the form of strong environmental awareness and cultural support for biodiversity, significant institutional capacity, to devise and manage solutions as well as strong links between the protection of natural assets and rural economic activity. The existence of a mix of policy and non-policy drivers that is able to maintain a degree of balance and stability in the farmed landscape (of farm structures, farming communities and their skills and knowledge) for relatively biodiverse agricultural habitats managed by longstanding agricultural practices, is indeed important. These need to be developed where they do not currently exist.

There is much evidence to suggest that where farmers have a high level of awareness of the environmental implications of their management practices, where there is good cooperation between different government departments and stakeholders and where institutions are well-informed about biodiversity, its value to economic development and its requirements, protection and enhancement are much more likely to occur. Conversely, evidence indicates that a lack of such institutional capacity and/or farmer awareness can create significant barriers to the effective adoption and implementation of biodiversity-friendly policies and practices. In essence, greater understanding among both policy beneficiaries and policymakers/administrators will favour biodiversity conservation and help to reinforce synergies and avoid conflicts when policies are designed and implemented through locally responsive and partnership-based approaches.

Achieving biodiversity conservation through agriculture as a strategic perspective

Delivering biodiversity and ecosystem services through the agricultural sector cannot be seen in isolation from the delivery of other environmental, social or economic objectives. Therefore, although the CAP will continue to play a central role, the broader context is also critical.

Finding the right balance between the delivery of 'non productive' ecosystem services from agricultural land, such as water quality, pollination, valued landscapes and of course biodiversity itself, and creating favourable conditions for producing crops, livestock and energy is a challenge in view of ensuring the long term sustainable management of land. Issues in relation to the use of land for biofuels and the deployment of new technologies will have to be addressed quite urgently as part of this challenge.

Consequently, an integrated approach is required that can identify win-win opportunities wherever possible, whilst recognising the importance of potential conflicts and trade-offs that may need to be made. Solutions on the ground will vary in different parts of the EU-27,

according to local conditions. Some will require the maintenance of existing farming systems and land management practices, while others will require changes to be made, particularly within more intensive farming systems. In some cases, highly tailored and targeted policy measures are needed that are focussed on the specific management needs of a particular species or habitat in a particular location. In other situations a few simple requirements that can be applied across the whole farmed landscape are needed. A complete strategy involving the CAP also needs to address the underlying viability of farming systems and structures, particularly where these are linked strongly to the provision of biodiversity. Increasingly, innovation in production methods and/or management practices will be needed in order to find ways of increasing food production in the long term, without damaging the environment and biodiversity. To meet these priorities, a spectrum of measures is needed within the CAP, from the highly specific to the broader brush.

Of the current policy measures available, the most beneficial for biodiversity is the agri-environment measure. This measure is particularly flexible and can be designed to deliver both targeted and tailored activities as well as simpler management adjustments across the farmed countryside. Since sustained and appropriate management over a period of years is often important to secure biodiversity benefits, a measure which can deliver this over a specified and extended period of time is of particular value. The contractual nature of the agreement is therefore important; it provides a frame within which the requirements, the timescale concerned and the payment to be made are set out clearly. Since it is binding, it also ensures a sustained commitment by the farmer, who has the certainty of receiving the corresponding payment upon compliance.

However, the voluntary nature of agri-environment schemes, combined with the limited funding available through Pillar 2 means that there are limits to what can be achieved for biodiversity through this measure on its own. The legislative proposals for the reform of the CAP from 2014 onwards have suggested the introduction of generalised, annual payments for mandatory 'agricultural practises beneficial for the climate and the environment' into Pillar 1. These are linked to direct payments, as one means of achieving greater benefits for biodiversity, particularly for common and widespread species, across the farmed countryside (COM(2011) 625/3). These proposals represent a significant shift in the composition of direct payments, with the proposal to allocate a substantial proportion (30 per cent) of direct payments into payments for delivering environmental benefits, with the measures having a very wide reach.

Identifying simple one-size-fits-all annual management practices that can provide significant environmental benefits is not straightforward, because ecological requirements are typically context-specific. However, three measures have been proposed that could be implemented on this basis – ecological focus areas, maintenance of permanent grassland and crop diversity. Amongst the proposals, the measure that perhaps has the most potential to deliver additional environmental benefit is the 'ecological focus area', which requires a proportion (seven per cent is proposed) of a farm's eligible hectares (excluding land under permanent grassland) to be allocated for ecological purposes, for example as landscape features, buffer strips or fallow land. This undoubtedly has the potential to provide important biodiversity benefits, such as for birds, mammals and invertebrates, as well as

benefits for aquatic biodiversity as a result of reduced run off and pollution of water courses. However, the actual magnitude will depend on the precise details of this measure, which are not yet clear. Furthermore, the benefits for biodiversity could be increased significantly by the targeting and appropriate tailoring of management practices on the land concerned, which in many cases might be achieved through the use of agri-environment agreements.

Requiring permanent pasture to be maintained at the farm level should also deliver some biodiversity benefits. The most widespread impacts would be in terms of constraining the conversion of improved grasslands to temporary grasslands and arable crops (eg maize), with benefits for soil condition and biodiversity, and knock-on benefits higher up the food chain, as well as for aquatic biodiversity. The conversion of semi-natural grasslands, which are of particularly high biodiversity value, to temporary grassland or arable would also be constrained, although the risks they face from agricultural improvement or abandonment will need to continue to be addressed through other measures, such as the agri-environment measure. Furthermore, the use of 2014 as the reference year for the area of permanent grassland to be maintained may give farmers an incentive for the conversion of permanent grassland in the interim. As a transitional measure the Commission has proposed to extend the current national permanent pasture cross compliance for a few years.

Introducing more diversity into cropping patterns, particularly where large scale monocultures predominate currently, has the potential to bring modest benefits for biodiversity. There is little evidence, however on what the precise biodiversity impacts are likely to be, although it is likely to benefit more common and widespread species due to improvements in soil biodiversity and overall invertebrate populations. As with any biodiversity measure, however, impacts will be context specific.

The 'greening' measures should not be seen in isolation. They should provide a broad foundation on which more focussed agri-environment schemes under Pillar 2 can build. Importantly, Member States will then have the flexibility to use the proportion of the budget currently allocated to the agri-environment measure to incentivise more tailored and targeted management activities.

The environmental potential of all broad brush measures can be maximised by appropriate design of the detailed rules, followed by sensitive and diligent implementation on the ground and monitoring of impacts to identify necessary refinements. The existence of a suitable suite of EU measures within the CAP regulations is therefore only the first step. Subsequently more detailed design and implementation of measures at the Member State or regional level, using broad brush and more targeted approaches in combination, is essential to address local biodiversity needs effectively.

Whichever policy approaches are used and in whichever combination, adequate funding is essential. In addition, there are a number of other common principles that need to be included within the policy architecture to ensure effective delivery for biodiversity. These include:

- the need for clear strategic objectives to set out the key priorities for the policy (or policies) in question, providing a framework within which more detailed policy measures can be established and to ensure coherence between different elements of the policy;
- sufficient discretion designed into the policy to allow Member States to use measures in the most appropriate combinations and design policy responses that are regionally specific to address the priorities and needs identified locally;
- mechanisms to secure cumulative benefits over a period of years and allow longer term objectives, such as habitat restoration, to be achieved; and
- meaningful monitoring and evaluation.

Institutional capacity is a significant limiting factor in the effective delivery of biodiversity outcomes through agriculture and addressing this is seen as a key priority.

Although the CAP has an important potential to contribute to biodiversity outcomes on farmland, the achievement of biodiversity goals associated with agriculture cannot be seen in isolation from factors outside policy altogether, other policies specifically focussed on biodiversity and habitats (for example the Birds and Habitats Directives, the LIFE+ programme and the implementation of the Natura 2000 network), and locally specific policies, such as land use planning, even if biodiversity goals are not their prime focus. Achieving biodiversity goals through the CAP may become more difficult or more costly if other policy processes are pulling in different directions and the value of biodiversity to society is not fully recognised.

In relation to agricultural land use and biodiversity, a key issue is the increased competition for land for different purposes. Increasing demands on land as a basis for agricultural production risks putting even further pressure on the delivery of environmental services, including biodiversity over the coming decade. As biodiversity comes under increased pressure public intervention is therefore justified to address the undersupply of these public goods.

Alongside measures within the CAP, integrating biodiversity goals within those of other EU funds and policies will help to maximise synergies and allow biodiversity to be seen as a component part of achieving other EU and national policy goals. Although biodiversity does not feature strongly within the EU2020 strategy, the recently published Roadmap for a Resource Efficient Europe, taking forward the sustainable growth objective of the EU2020 strategy, gives considerable emphasis to biodiversity, placing biodiversity and ecosystem services near the heart of its vision for 2050. The legislative proposals for the new CAP aim to integrate these principles into future support for the agricultural sector and rural areas , supporting employment and growth, promoting innovation and enhancing both the ‘economic and ecological competitiveness’ of agriculture.

Conclusions

A step change is needed to be able to meet the new 2020 biodiversity targets for agriculture, and this requires action on several different fronts. Of all the EU funding

policies, the CAP has the greatest potential to deliver biodiversity on farmland and its relationship with the Biodiversity Strategy is of key importance for delivering the EU's 2020 targets for biodiversity. To achieve such a step change, some unresolved issues need the attention of policy makers at different levels of governance:

- Firstly the spatial scale over which agricultural biodiversity is delivered needs to be increased significantly and the efficiency and effectiveness of measures improved to ensure that biodiversity thrives in the wider countryside as well as in protected areas.
- Secondly the legislative framework currently in place to protect Europe's most valued biodiversity needs to be fully implemented and adequately enforced to provide a sound foundation on which other policy measures can build.
- Thirdly, sufficient public funding needs to be available to support biodiversity provision on agricultural land, above and beyond that which is required by law. Estimates on the scale of funding required indicate that significant increases are needed compared to the amounts that are currently available. Funding from both pillars of the CAP will be the main source of financing and appropriate mechanisms are required to guide Member State expenditure in this direction. Expenditure under the CAP, whether green payments in Pillar 1 or EAFRD rural development plans, needs to be linked to plans at the national level to deliver on biodiversity targets.
- Fourthly, the report highlights the importance of using combinations of measures to provide integrated packages of support to farmers. A balanced programme of measures would combine those concerned with agri-environment management with those designed to support capital investments in farms and rural areas, measures to secure the economic viability of farms and rural areas (for example, access to markets, diversification, creation of micro-enterprises, encouragement of rural tourism, and conservation of rural heritage); and measures to develop the skills and capacity of farmers (for example, extension services, provision of information, advisory and training). More emphasis should be given to developing these packages and a lot can be gained from their utilisation in a more systematic way. Also, in light of the proposals for the reform of the CAP it will be crucial that Pillar 2 measures are designed and targeted by Member States in ways that build upon the greening requirements in Pillar 1.
- Finally, the role of innovation in fostering sustainable land management needs to be encouraged to allow any increases in agricultural production to be carried out in a sustainable way, taking account of the needs of biodiversity and the provision of the full range of ecosystem services.