

Agriculture and the conservation of wildlife biodiversity – comparative analysis of policies in the USA and the EU

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Introduction

We analyze and compare environmental and agricultural policies for conserving the biodiversity of wild plants and animals on agricultural lands in the European Union (EU) and the United States (US). The discussion of strategies for conserving biodiversity at community level (EU-level and federal in the US) and the role of agriculture in this context provides the lead for subsequent sections on the implementation of different policy instruments. We pay special attention to the distribution of competences within the multi-level policy systems of the EU (regional, national, EU level) and US (state and federal, to the extent that state programs implement federal law), and discuss mechanisms for introducing and implementing new instruments. Finally, we compare both approaches and draw conclusions and lessons that support transatlantic learning.

Farmland and biodiversity

Europe's countryside and cultural landscape has been shaped by farming over centuries, with agricultural area covering about 47% of the total area of the EU³. Contrary to the US, in Europe there is typically a tight intermixing of agricultural land use and settlement, with the distribution of farmland as a share of total area being more uniform and the variation in population density being lower than in the US. This is reflected in the emphasis placed on the role of agriculture in achieving environmental aims and the importance attached to them (Cochrane and Wojan, 2008).

In Europe the long co-development of species, ecosystems, and cultivation resulted in a species-rich rural landscape with a peak around the year 1850 (Sukopp and Trepl, 1987 in Hampicke, 2006). Farms are seen as an integral feature of a landscape and the maintenance of local landscape is more likely to be associated with sustaining farms and preventing land abandonment than in the US (Blandford and Hill, 2008; Cochrane and Wojan, 2008). It is been estimated that about 50% of species in Europe rely on agricultural habitats (EEA, 2006). According to the EEA (2007) "remarkably few areas of even the highest conservation value are truly natural. Areas defined by ecologists as semi-natural

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³ EU-25 in 2004 (EEA Report No 9/2005)

farmland, forest and grassland habitats are home to many of the continent's most valued species. Therefore, the continuation of traditional methods of land management is essential to the survival and well-being of species in these areas". Thus, agriculture has a key role to play in protecting biodiversity by conserving genes, species and habitats. Modernization and intensification of European agriculture have significantly reduced biodiversity during the last few decades. On the other hand some marginal land has been under-utilized or abandoned. In contrast, there have been clear signs of progress in reducing threats to and enhancing the biological diversity of Europe's forests (EEA, 2006). The decline of farmland-related species of birds, which serves as an indication for the general state of farmland biodiversity, is a major area of concern across Europe. Some critical conservation issues relate to the disappearance of habitats associated with traditional, more extensive agricultural practices; the loss of set-aside land; elimination of landscape elements, such as hedgerows; the drainage of wetlands; intensification or else abandonment of extensive grassland; conversion of grassland to arable land; increased pesticide and fertilizer use; and more monotone crop rotations. Intensification generally took place in the lowlands on fertile soils, while land on slopes, in high altitudes and with marginal soils has tended to be abandoned or afforested (Osterburg et al, 2008). Recent increase in prices for agricultural commodities together with ambitious goals for energy from renewable fuels, such as biomass, and abolition of obligatory set-aside currently fuel concerns about increased intensification of agricultural land.

In the United States, agriculture has, until the last few decades, meant less biodiversity, not more relative to what existed on the large expanses of grassland and wetland that had been converted to agricultural use. Farmers and ranchers own and manage about 1029 million acres in cropland or grazing land. (416 million hectares) of the roughly 2.3 billion acres (930 million hectares) (ERS, 2008)⁴, amounting to roughly 46% of the total area, not including private forests and woodlots. Land in private agricultural use comprises over 54% of the contiguous lower 48 states. Over two-thirds of the nation's wildlife habitat is distributed over land in private generally agricultural use (NRCS, 2008)⁵. Many endangered and threatened species (species at risk of extermination) use or reside exclusively on private, generally agricultural, lands (FWS, 2008)⁶.

Federal and state policy relating to the conservation of wildlife and plant biodiversity explicitly acknowledges the importance of agriculture to its success (Brady and Flather, 2001 and USDOJ and USDA, 1992). Indeed, since 1996, agricultural policy has made the

⁴ United States Department of Agriculture Economic Research Service (ERS), available at <http://www.ers.usda.gov/briefing/landuse/majorlandusechapter.htm>, accessed Nov. 22, 2008

⁵ United States Department of Agriculture Natural Resource Conservation Service, Agricultural Wildlife Conservation Center, <http://www.whmi.nrcs.usda.gov/>, accessed on November 22, 2008

⁶ United States Department of the Interior Fish and Wildlife Service, Endangered Species Program, <http://www.fws.gov/endangered/landowner/index.html>, accessed on Nov. 22, 2008

protection of wildlife and wildlife habitat a coequal objective of conservation programs along with the protection of soil productivity and water quality. Moreover, federal and state governments have used agricultural policy as the vehicle for shifting the emphasis onto financial incentives and away from mandatory restrictions on land use. However, high agricultural commodity prices and increasing reliance on biofuel and biomass production raise the question of whether or not public funding for conservation of biodiversity and wildlife protection on agricultural lands can keep pace with market demands for more intensive production.

1. Biodiversity-oriented policies in the European Union

1.1 Objectives and strategies at EU level

EU biodiversity policy development

The two central directives concerning the conservation of habitats and species are the directive on the protection of wild birds (79/409/EEC; “Birds Directive”), which, enacted in 1979, is the oldest piece of nature legislation at the EU level, and the directive on the conservation, of natural habitats and wild fauna and flora from 1992 (92/43/EC; “Habitats Directive”). The two directives form the basis for an EU-wide network called “Natura 2000” areas.

For environmental policy outside of legislation, the EU issues Environmental Action Plans (EAP), which outline actions for the next years and are binding for member states. The current sixth EAP (CEC, 2002) lays down specific priority actions, including the integration of biodiversity into the Common Agricultural Policy. The goal of halting the loss of biodiversity by 2010 was reinforced by the EU’s Sustainable Development Strategy⁷, but is unlikely to be met (EEA, 2006; European Commission, 2008).

All members of the EU, along with all other European countries, have signed the CBD. As a consequence, each state has developed or is developing national biodiversity strategies and action plans. The EU is committed to implementing the CBD and has issued a Communication on a European Biodiversity Strategy that contains the general policy orientation⁸. The Strategy defines a framework for the actions necessary to fulfill the legal obligations concerning conservation and sustainable use of biological diversity and states how it will integrate environmental concerns into other sector policies. However, the Biodiversity Strategy and the related sectoral Biodiversity Action Plans (e.g. for fisheries

⁷ COM (2001) 264 final

⁸ COM (1998) 42 final

or agriculture) do not have legislative status. Acknowledging that the pace and extent of implementation of the Strategy has been insufficient at both EU and member state levels, the “EC Biodiversity Communication 2006” with a new EU Biodiversity Action Plan to 2010 and beyond⁹ responded to the 2010 commitment and specified actions and provided targets and indicators against which to evaluate progress. EU member states are encouraged to adjust their own strategies and action plans accordingly. Important actions with special relevance for the agricultural landscape are the finalization and management of the EU-wide Natura 2000 network including its connectivity, species action plans, securing/restoring “high-nature value farmland” and forests, putting in place river basin management plans and reducing principle pollutant pressures. These actions have to be translated into concrete mandatory or voluntary policy measures, which bring about the desired practices.

Integration of biodiversity issues into the Common Agricultural Policy (CAP)

The CAP, now representing over 40% of the EU’s budget, has undergone extensive changes in response to EU commitments to make progressive reductions in domestic agricultural trade-distorting support payments and trade restrictions. At the same time, there have been political demands to address the positive and negative side effects of agriculture as a consequence of growing social awareness.

Introduced as a policy mainly for price protection of agricultural products, the CAP has been one of the drivers for the loss of biodiversity. However in the course of the McSharry reform in 1992 the CAP underwent a considerable reorganization, resulting in two “pillars”, one for market concerns (including direct payments as income support to farmers) and a much smaller one aiming at rural development, however with a clear focus on agriculture¹⁰. Within the second pillar, agri-environmental measures (AEM) became mandatory. Another feature of interest in relation to biodiversity has been the obligatory set-aside of arable land. Introduced in order to limit overproduction, it resulted as well in positive environmental side effects especially in connection with incentive measures for long-term set-aside. The 2003 CAP reform led to further fundamental changes to the policy system, not least in order to back up the legitimacy of the high support payments to farmers and to bring forward “environmental policy integration” into other economic sectors, a concept having been promoted by the EU for several years (EEA, 2005).

Measures under market and income policy of the CAP that presumably provide indirect benefits to biodiversity include the following: mandatory cross-compliance, a new system of direct payments (the largely decoupled single farm payment, area-based payment

⁹ COM/2006/0216 final and Technical Annex

¹⁰ For the period from 2007 to 2013 €286 billion will be spent on pillar one (IEEP, 2008); €90,8 billion from the EU budget are allocated to pillar two (including national or regional cofinancing this amounts to €148.5 billion) (European Commission, 2008)

entitlements with the option for farmers to set-aside up to 100% of their land and merely keep it in “good agricultural and environmental condition”), and modulation (shifting funds from the first to the second pillar). Decoupling gives greater flexibility for extensification or diverting land for non-agricultural use. Landscape elements, such as hedges and the land upon which they are installed, now belong to the area eligible for support, which may help to increase their acceptance by farmers (Osterburg and Horn, 2006). However, grazing systems might come under pressure of being abandoned as e.g. suckler cows are highly dependent on coupled headage payments. The new Rural Development Regulation¹¹ provides *inter alia* for enhanced support for Natura 2000; maintains AEM and payments for areas with natural handicaps or in danger of abandonment; and provides for investment, marketing and training provisions and a set of measures in support of afforestation and sustainable forest management. Further modifications to the CAP, some of them with relevance for biodiversity, have recently been decided on, among them the abolishment of obligatory set-aside, increased modulation and a modification of cross compliance.

Implementation within the political multi-level system

A challenge for successful implementation of agri-environmental policy in the EU is the translation of concepts, objectives and framework conditions decided at supranational level into administrative and private action at the regional and local level. Differing structural and geographical conditions and regional and local environmental targets have to be taken into consideration while maintaining a common baseline for environmental targets and public efforts.

Strategies and the legislative framework at the EU level contribute to a coordinated approach among member states, however with the concretization and implementation of EU level policies taking place at a lower level according to the principle of subsidiarity. The regional and local level are crucial for policy implementation. This allows for tailoring measures to regional and local circumstances, including different priorities or varying interests and different historical development of institutional and policy processes and administrative procedures in member states.

1.2 The Natura 2000 network, designated areas and the farming sector

Many mandatory standards concerning agricultural land management are based on legislation set at the EU level. These include laws that establish standards for the larger agricultural landscape, e.g. the Nitrates Directive or – especially relevant for biodiversity

¹¹ Council Regulation (EC) No 1698/2005

- the Birds and Habitats Directives¹². The basis for EU action regarding the safeguarding the most important habitats and species is provided by the Birds and the Habitats Directives. A central objective is the creation of a coherent ecological network of designated areas across the EU, the Natura 2000 areas¹³, which already shows clear benefits for biodiversity (Donald et al, 2007). The Natura 2000 network consists of
 - 'Special protection areas (SPAs) to conserve about 200 bird species and sub-species listed in Annex I of the Birds Directive as well as migratory birds and
 - 'Sites of Community importance' (SCIs) which will consequently be designated as 'Special areas of conservation' (SACs) to conserve over 200 habitat types, and habitats of over 1,000 animal and plant species listed under the Habitats Directive.

Member states are required to contribute to the network and are obliged to designate the relevant sites and to maintain or restore a “favourable conservation status” of the natural habitats and the populations of species of wild fauna and flora. There was little flexibility for designations since trade-offs, e.g. high opportunity cost, were not allowed to be considered during this procedure. Member states must also take steps to avoid significant deterioration of the habitats and prevent disturbance of the species. In total Natura 2000 covers 17% of the EU land territory (European Commission, 2008). In addition there are marine areas.

Natura 2000 areas are not pristine, undisturbed areas. Agricultural land use often takes place in Natura 2000 areas, the share in most member states varying between 20 and 40%¹⁴ with pasture being the dominant agricultural land use (Osterburg et al, 2007). These habitats depend on the continuation of extensive agricultural practices. Complementing Natura 2000 areas, the Habitats Directive emphasizes the ecological coherence of the Natura 2000 network with the maintenance and management of landscape features (e.g. river banks, hedges, field woods).

The Birds and Habitats Directives do not directly set standards for land management. The basic obligation for farmers is to obtain permission for projects that might significantly impact on the conservation issues in Natura 2000 areas. The design of the actual conservation measures is left to the member states: mandatory limitations on agricultural land use (e.g. a ban on converting grassland) or voluntary incentive measures to maintain extensive agricultural management or to implement nature conservation measures.

¹² EU regulations apply throughout the EU directly, whereas directives require individual member states to transpose its requirements into national law for an implementation.

¹³ Besides, the directives as well include bans on keeping, trading or hunting certain species, and the deliberate introduction into the wild of species which are not native to their territory.

¹⁴ status of November 2005

Detailed measures for designated areas are often defined regionally and may differ from area to area.

Natura 2000 sites are not the only areas in Europe under nature protection. Each country has its own policy and legislation for establishing protected areas at the national or regional level. There has been a strong increase in the total area of nationally designated protected areas in Europe over time¹⁵. Not all nationally designated areas are part of the Natura 2000 network (e.g. in Germany and the UK over 70% of designated areas lie outside of Natura 2000). On the other hand, the implementation of Natura 2000 has resulted in significant additional designations in most member states. However, the indicator gives no indication concerning the quality of management in these areas or how these are protected from incompatible uses. An analysis of area-related protection of grassland as a consequence of national law in Germany suggests that rules, along with the transparency of their design and their enforcement, at a subnational level can be highly diverse even within a member state (Nitsch et al, 2008).

1.3 Cross compliance

Cross compliance, the linking of the full receipt of direct support payments to compliance with minimum farming standards, was a major component of the 2003 reform of the CAP; its implementation has been mandatory for all member states since 2005. As a horizontal instrument, cross compliance imposes minimum standards for land management, which have the potential to contribute to biodiversity on all land receiving direct payments.

In accordance with the legal EU framework for cross compliance member states set standards in relation to a number of EU regulations and directives for the protection of the environment; public, animal and plant health; and notification of diseases and animal welfare. Cross compliance reinforces these existing laws and contributes to a harmonized enforcement procedures throughout the EU. In addition standards for “Good Agricultural and Environmental Conditions” (GAEC) have to be respected. They establish a floor on soil conservation, minimum maintenance of land and the protection and management of water. Especially standards that establish a minimum level of maintenance (e.g. retention of existing landscape elements, protection of permanent grassland and avoiding encroachment of unwanted vegetation) have a link to biodiversity, although in many cases they are not explicitly designed for this purpose.

There is much flexibility and variation in what practices are adopted since farmers must meet only those standards that have been implemented in the respective member state,

¹⁵ http://themes.eea.europa.eu/IMS/IMS/ISpecs/ISpecification20041007131611/IAssessment1175086782375/view_content

Considerable scope for a national implementation according to different priorities and conditions exists regarding GAEC (Nitsch and Osterburg, 2007). Few member states set relatively ambitious standards (e.g. creation of buffer strips, differentiated standards for soil protection, standards limiting over- or undergrazing). Others implement only a minimal set of GAEC standards, often not having applied all standards listed in the EU framework, and low requirements are set at the farm level to limit the burden on farmers and the government administration and to preserve the possibility for incentive measures. In a recent report, the European Court of Auditors found, that in a significant number of cases the requirements were purely formal. In addition controls carried out at farm level were often minimal especially for requirements under the Birds and Habitats Directives (European Court of Auditors, 2008). Changes to cross compliance since 2009 include clear differentiation between GAEC standards that are mandatory in the member states and others that are optional.

Table 1 shows typical responsibilities of different administrative levels for the design and implementation of cross compliance in the EU.

Table 1: Involvement of different policy levels in design and implementation of Cross Compliance

	EU level	National level (ministries)	Regions (admin.)	Local level (admin.)
General objectives and framework (standards, control, sanctions)	X	X	C	
Definition of concrete standards		X	(X)/C	
Approval	X			
Financing (Direct payments)	X			
Implementation:				
- Selection of control sample		X	X	(X)
- Control		(X)	X	X
- Calculation of sanctions		X	X	?
Control of proper implementation	X			
Monitoring and Evaluation	X			

X: regular involvement; (X): occasional involvement; C: consultation/participation

In the majority of member states, the Ministry of Agriculture or its equivalent took the lead in developing and defining farmers' obligations, often establishing formal working groups bringing together various or enabled consultation with relevant authorities (Alliance Environnement, 2007). The Commission does not formally approve national cross compliance standards, however it aims to ensure a minimum level-playing field through its monitoring and audit activity. Underlying EU-legislation lays down detailed rules for establishing control systems for cross compliance. In many cases, cross compliance has resulted in the need for greater coordination between existing control bodies and the designation of an overall coordinating authority. Besides setting the formal framework and providing funding for direct payments the EU controls member states upon compliance with the procedures. Cross compliance allows for a system control by the EU,

if and in which way member states carry out controls of legislation derived from EU law and if these are consistent with the requirements aiming at a better and more harmonized enforcement. Insufficiently implemented procedures can result in disallowances, thus deductions of CAP payments allocated by the EU to the member state. This mechanism completes infringement procedures before the European Court of Justice in case of inadequate implementation of EU-legislation in the member states.

In its current implementation in Europe only little benefit for biodiversity due to cross compliance can be expected, and even negative impacts through removing unwanted vegetation in order to maintain “good conditions” are possible (Osterburg et al, 2008). Cross compliance suffers from the fact that horizontal requirements don’t mirror the different compliance costs of individual farmers. Thus, it can reinforce existing legislation and gives the opportunity to set area-wide minimum standards through GAEC, which may benefit biodiversity, but is hardly suitable for steering land management adapted to regional and local conditions.

1.4 Incentive-oriented agri-environmental measures

Agricultural management practices that exceed standards set by legislation and cross compliance may be eligible for support payments. Agri-environmental measures (AEM), an important feature of the EU’s rural development policy, are cofinanced through the European Agricultural Fund for Rural Development (EAFRD) within the CAP (EC Reg. 1698/2005). Minimum spending for the different packages of measures, as well as eligible measures, is set in this regulation. It also establishes maximum amounts to be granted to farmers, the length of contracts (5 to 7 years) and the requirements for monitoring and a formal evaluation process. EU strategic guidelines have to be taken into account in national strategy plans and in the national or sub-national rural development programs. Annual payments to farmers are to cover expenses and income foregone and, where considered as necessary, also transaction cost. Important measures, which may be adapted to regional needs, are organic farming, less-input grazing, erosion control and water protection, and specific nature conservation measures e.g. addressing high-nature value grassland. The bulk of measures are integrated into agricultural production systems and do not require land to be set aside.

Funds for rural development are allocated to the member states taking into account the regions eligible under the Convergence Objective, past performance, unique circumstances, and needs based on objective criteria. The EAFRD contributes 80% of eligible public expenditure in “Convergence Regions”¹⁶ and 50% in other regions; the rest

¹⁶ Regions lagging behind economically are granted higher rates of co-financing, this being in line with the long history in the EU of assisting such regions

has to be financed by member states. AEM are financially the most important single measure in the rural development policy of the CAP. However, due to the enlargement of the EU, many of the EU-15 now receive less EU-funds for rural development compared to the last support period, despite the increasing importance of objectives such as funding for Natura 2000, the further expansion of organic farming, flanking the Water Framework Directive, and climate protection. The division of the budget for member states does not take into account variation in Natura 2000 land area among states.

The distribution among levels of government of responsibilities in the implementation process is shown in Table 2.

Table 2: Involvement of different policy levels in design and implementation of Agri-environmental measures (AEM)

	EU level	National level (ministries)	Regions (admin.)	Local level (admin.)
General objectives and framework	X	X	C	
Design of AEMs (programming)		X	X	(X)
Approval	X			
Financing	X	X	X	(X)
Implementation:				
- Gathering and approval of applications		(X)	X	X
- Payments		X	X	(X)
- Control and enforcement		X	X	X
Control of proper implementation	X			
Monitoring and Evaluation	X	X	X	C

X: regular involvement; (X): occasional involvement; C: consultation/participation

Successful implementation of AEM supported by the EU depends on the interactions between many institutions at different levels, especially the EU, national, regional and local levels. The budget allocated to AEM, area coverage and the design of AEM differs widely between and as well within member states. The framework for AEM is set at the EU level for all member states through regulations. The EU approves the programs of the member states and its measures, involves itself substantially in financing the AEM, and oversees implementation.

Depending on the level of centralization or decentralization of the member state, different administrative levels are involved in programming, financing, implementation and control¹⁷. Programming and parts of implementation such as payments are commonly performed at the national level under the responsibility of ministries in charge of agriculture. Involvement of regional and local levels and participation of the

¹⁷ E.g. Italy, Germany, Spain and the UK have several regional rural development plans with different sets of measures

environmental administration and civil society organizations vary. All these actors articulate their objectives, which may include budgetary concerns, environmental issues, or farmers' income. The policy process and the relative strength of the actors influence the outcome (Eggers et al, 2007). A general tendency for the design of AEM is towards more involvement of the environmental administration, notably concerning nature conservation measures, with other stakeholders submitting comments during the consultation process or, in some member states, even participating in the decision-making bodies (Nitsch et al, 2005).

Horizontally offered extensification measures with flat-rate payments and standardized requirements are normally centrally organized by the agricultural administration and are characterized by comparatively low administrative costs, but without the possibility to adapt to local objectives or seasonal conditions. They are thus rarely suited for targeted nature conservation, which requires site-specific management often associated with traditional low-input systems. Stronger involvement from lower administrative levels and environmental associations is perceived to be connected to higher environmental effectiveness (Eggers et al, 2007). On the other hand, increasing precision and differentiation of AEM, which is a characteristic of targeted nature conservation measures, tend to increase administrative cost of implementation. Examples of measures with objectives for nature conservation are extensification of agricultural production, wildlife friendly management such as late mowing of grassland, the creation of landscape elements or field strips, practices targeting specific habitats and species or setting-aside land¹⁸.

Even though examples of effective AEM for biodiversity on agricultural land exist and positive perception of the cooperative approach among farmers, measures generally suffer nevertheless from limited budgets and high administrative costs. This results in too limited a suite of measures and low attractiveness especially on more intensively managed land. Voluntary participation implies the dependence on the willingness of farmers to participate with management of the land possibly reverting after the ending of a contract. This dilemma demonstrates the limitations of voluntary extensification measures in a scenario with high prices for agricultural commodities and strong support for energy crops especially on more intensively used land suitable for arable production.

Additional incentive measures for nature conservation

In addition to AEM, there are other incentive measures within the CAP's rural development policy that address nature conservation issues, such as payments for non-productive investments, for drawing up management plans or providing information and advice. Support for areas with handicaps is an untargeted instrument based on flat-rate payments mainly for grassland in mountain areas or other regions with unfavourable

¹⁸ Rotational or long-term set-aside for water or nature protection (10-20 years)

conditions. However, these payments serve as a basis support for high nature value grazing systems (IEEP, 2007). A further support instrument for nature conservation with co-financing by the EU outside of the EAFRD is the LIFE+ program (“Financial Instrument for the Environment”), which can support best practice or demonstration projects that contribute to halting the loss of biodiversity.

Finally, there are measures solely designed and financed by the national state, the regions or at the local level in order to have more flexibility from EU prescriptions, e.g. concerning duration, funding and beneficiaries. However, these measures generally have to be approved by the EU as well, as the EU aims at transparency and harmonization concerning support to farmers.

1.5 Key characteristics of the EU approach

In Europe, agricultural land is seen as an integral feature of the landscape and has high importance for biodiversity. Modernization and intensification on the one hand and at the same time marginalization and under-utilization of agricultural land have resulted in significant biodiversity loss during the last decades. The EU’s objective to halt the loss of biodiversity by 2010 requires addressing agricultural practices. Objectives and actions have been recorded in strategies and action plans and have to be translated into concrete policy measures.

Environmental aspects have increasingly been considered within the CAP, namely via a high variety of AEM in its Rural Development Policy, and – setting horizontal minimum standards – in cross compliance. Linking environmental (and other) standards to direct payments through cross compliance addresses income objectives and market failures (e.g. for the provision of biodiversity) at the same time. However, this is a relatively untargeted measure for biodiversity conservation. AEM can support specific management practices, however implementation is generally limited by budgets. A key objective regarding biodiversity protection in the EU is the creation of a EU-wide network of Natura 2000 areas that encompass agricultural land. Mandatory measures may limit agricultural management in these and other designated areas with or without compensation, or voluntary incentives may be offered to achieve desirable practices.

The implementation of such policies is shaped by the multi-level governance system of the EU. From the outset, European integration was about the transfer of powers from the national to the European level (Benz and Zimmer, 2008). No other international form of cooperation is characterized by such far-reaching integration as the EU. Common objectives (e.g. climate change, Natura 2000, water management), strategies and a legislative framework at EU level contribute to a coordinated approach and transparency within the EU. This cooperation often induces member states to raise standards or to allocate EU-funds to certain measures, which are linked to common objectives.

The concretization and implementation of policies take place at a lower level according to the principle of subsidiarity, with the regional and local level being crucial for policy implementation. Policies affecting agricultural land use are strongly influenced by frameworks set at the EU level (e.g. rules for the allocation of direct payments, framework regulations for mandatory standards, cross compliance and rural development) with varying degrees of freedom for national and regional implementation. Member states themselves have to report back to the EU e.g. on the progress of the implementation of EU legislation, of cross compliance and on the evaluation of rural development measures, which provides a certain degree of transparency and encourages a process of reflection and justification for measures. The benefits of this process come at the cost of considerable administrative effort. Through the control of the allocation of EU-funds or the possibility to initiate infringement procedures before the European Court of Justice, the EU has options to sanction member states in case of insufficient implementation.

The upcoming discussion about the CAP after 2013 will offer the opportunity to substantiate the “European model of multifunctional agriculture”, which acknowledges the multiple outputs and services of a landscape, and to adapt policies accordingly. Such an integrated policy for agricultural land use should address biodiversity, soil, water and climate protection objectives. Under the heading “public money for public goods” a clear rationale and more quantitative accountability regarding desired effects of support on the environment are discussed.

2. Biodiversity-oriented policies in the United States

United States policy on the conservation of wildlife and plant biodiversity on agricultural lands reflects piecemeal enactment and implementation of federal statutes on species and wildlife protection. Rather than a seamless, comprehensive policy to protect or manage biological natural resources on private, agricultural lands, a collection of laws, regulations, internal policies of individual agencies, and interpretations of laws by individual agencies separately address different game, wildlife, and biodiversity objectives of natural resource management. This collage reveals both the state and the evolution in the science of wildlife management and biodiversity and the conflicting political views of not just how best to manage but also what entity - federal, state, or private/non-profit organization - is best equipped to manage what is inherently a public good that resides on private lands¹⁹.

Fundamental to United States policy on the conservation of wildlife and biodiversity is the principle established in the Public Trust Doctrine that wildlife is a public good that must

¹⁹ Though the United States is a signatory to the Convention on Biological Diversity, it has not ratified it. This paper examines that portion of United States policy that relates to conservation of wildlife and biodiversity on agricultural land.

be protected for public benefit. The biodiversity brought to biological systems is an indirect consequence of wildlife protection. The protections that are accorded to wildlife by federal law and policy accrue regardless of whether or not the land upon which they reside, whether permanently or temporarily, is public or private. State laws may exceed these protections, but they cannot make exceptions to federal law. The reality that wildlife often exists on private property creates a conundrum in implementing this policy. Thus protecting a public good can mean restricting a private right, which is protected under the US Constitution.

This treatment of wildlife as a public good, evolved over more than a century and a half of policy, has been sustained by the strength of what has come to be known as the North American model of wildlife conservation. As a resource under public trust, wildlife protections are allocated between state and federal governments and underpinned by sound science and management supported by regulated consumptive use (Prukop and Regan, 2005). Funding is by the users of the wildlife resource, which is effected through state-issued hunting and fishing licenses, state and federal game stamps, and excise taxes on fishing and hunting licenses. The states have legal authority for the protection of resident wildlife and the federal government reserves authority for protecting migratory birds and endangered/threatened species, and certain other wildlife under international treaties. Native American tribes retain authority for wildlife on reservations.

What constitutes protection for a species along with the degree of protection that a species receives depends in part upon whether or not a species of flora or fauna has been deemed, through a science-based process to be at risk of extinction, the species is migratory and protected through international treaties, or is dependent upon a habitat that is specific to a location. It reflects also the state of the science of biodiversity and how wildlife populations are best maintained and the ability of science to identify keystone species whose survival requirements match those for a broad ecosystem and which therefore support biodiversity (Harbison, 2004).

2.1 Objectives and strategies at the federal level

For species at risk of extinction, mandatory federal protections establish the floor on species loss and the protection and restoration of habitats upon which they depend. As illustrated in Figure 1, mandatory or command-and-control-type regulations serve to protect core biophysical life-support conditions that underpin ecosystems, such as clean water or air or wetlands, or seek to retard, if not reverse, the loss of wildlife and plant species at risk of extinction. Mandatory programs also apply to migratory species protected under international treaties. Least restrictive are agricultural policies and programs that either link agricultural subsidies to requirements for protecting wildlife or provide monetary incentives to provide habitat or protect wildlife.

Incentive and cost-share programs constitute the most significant federal intervention related to agriculture for the protection or conservation of wildlife and biodiversity on private lands. They generally involve direct payments for temporary and permanent land retirement, cost-share programs for habitat protection and restoration and linking federal financial support to agriculture to restrictions on how agricultural land is managed. The federal government partners with states and non-governmental, non-profit organizations to acquire easements, to restore habitat and to implement incentive programs for restoring habitat.

Focus of policy has been to conserve specific species, broad communities or ecosystems. Mandatory policies and cross-compliance tied to eligibility for agricultural subsidies restrict the loss of critical habitat for endangered/threatened species and wetlands. Because agricultural land cover has historically replaced natural vegetation, federal and state programs evolved to regain previously lost habitats, desired species, biodiversity and ecosystem functions.

Technological innovation has led to large increases in farm productivity, but also significant declines in agricultural prices. Agricultural policy embodied in “farm bills,” the name given to the broad agricultural legislation that is regularly reauthorized and revised, has generally shifted from emphasis on traditional government price support programs to programs that temporarily idle or retire land from intensive production. Thus, the more intensive farming of land most suited to agricultural use has allowed land less suited for cropping to be retired, at least from intensive production. Since the 1985 Farm Bill, targeting environmentally sensitive lands or lands of particular benefit to wildlife and biodiversity for temporary retirement has helped wildlife conservation reap the rewards of agricultural productivity increases. Subsequent amendments to these policies have sought a management of agricultural land retired from agricultural production that maintains a diverse non-climax suite of ecosystems, ensures fire protection, provides for flood control structures, and compensates for the loss of historic grazing communities. Over time, and with periodic reauthorization of agricultural legislation, policies have better targeted lands for restoration of habitat that benefit not just wildlife in general, but also species for which previous efforts have had little effect.

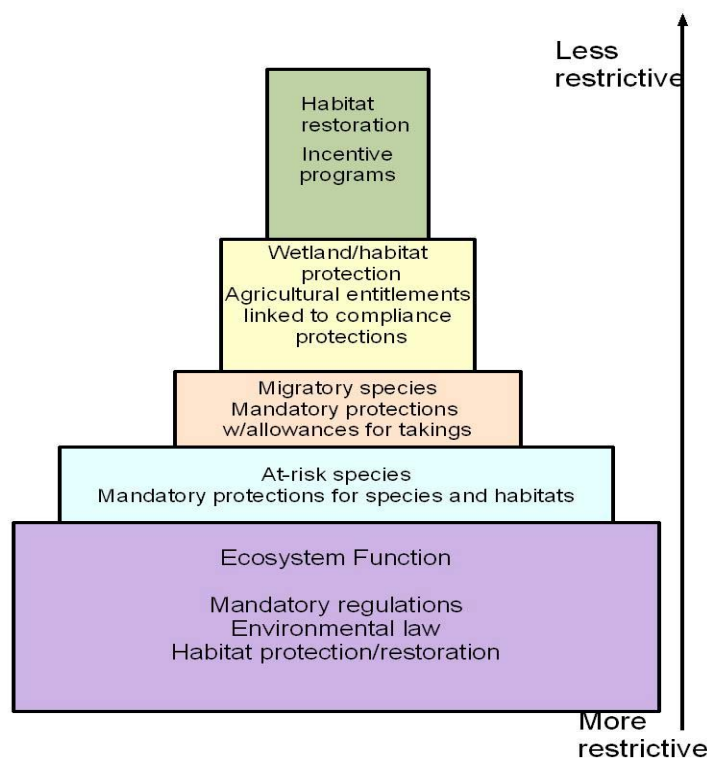


Figure 1: Relationship between policy and restrictiveness

The 1985 and subsequent farm bills have increasingly relied on financial incentives and market-based approaches to induce voluntary enrollment and management of private, especially agricultural lands. The 1985 Farm Bill offered producers financial incentives for voluntarily establishing grassland and forest cover on marginal croplands. Wetlands and riparian corridors and buffer strips were targeted in the 1990 Farm Bill. With the passage of the 1996 Farm Bill, wildlife conservation became a coequal objective of agricultural conservation policy along with protection of soils and water quality. Subsequent reauthorizations have provided further protections for grassland species, and implementation of set-aside programs has evolved to include incentives to restore special habitat types defined at the state level.

Partnering has assumed increasing importance in protection strategies. Where critical lands for wildlife have been degraded, federal funds, leveraged with state and private funds or in partnership with state and non-profit organizations, have restored degraded habitat on agricultural lands, introduced habitat management systems, or protected habitat from invasion by non-native species.

Priority has been to protect and restore those habitats of wildlife that have been most adversely affected by agriculture. Where species depend upon unique vegetation, such as wetland or grassland or border habitat, retiring the land from intensive agricultural use

permanently or at least long term²⁰ has characterized protection efforts. Funds have been targeted towards successional and disturbance-maintained ecosystems that have been lost from the landscape during the last three hundred years, not just from the conversion of native lands to farmland, but also from intensified land use. For species less dependent upon particular habitat, the strategy has been to provide financial incentives to farmers to manage the land in ways compatible with wildlife.

Since retiring cropland and preserving restored habitat alone cannot meet all the needs of biodiversity or species conservation, each succeeding farm bill since 1985 has directed resources to the management of lands that remain in agricultural use - so-called working lands - for wildlife benefits.

This shift in policy indicates the growing awareness of the scientific community of the importance of these lands to the objectives of wildlife conservation and species protection. The North American Waterfowl Management Plan establishes a continental strategy for waterfowl conservation that depends, in large part, on the management of agricultural lands to provide the necessary habitat. The welfare of many wildlife resources depends heavily upon the partnership between owners and operators of working agricultural lands and the conservation community (FS, 2009).

2.2 Mandatory programs protecting wildlife and habitat

Mandatory programs either protect individual wildlife and plant species or protect or restore the environmental conditions necessary for the protection of wildlife. Regulations prohibit the capture, destruction or harassment of certain at-risk species and may restrict economic use of land that has been identified as critical to protected species.

Endangered Species Act

The Endangered Species Act (ESA) provides a safety net for imperiled species of plants and animals. Its statutory authority is used to protect and restore the populations of wildlife and plants that are on the brink of extinction, to the extent that they have been identified and listed by regulation. All public programs, including farm programs, must demonstrate that they comply with the regulatory provisions of the ESA.

ESA also implements the US commitment to two international treaties that pertain to the protection of threatened and endangered species. These are the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (Pan American Convention).

²⁰ Some states have laws that prohibit the permanent retirement of lands classified as agricultural.

The Fish and Wildlife Service (FWS) and the National Marine Fisheries Service, which administer the act, work in coordination with other federal agencies) and state fish and wildlife agencies to document the science upon which the listing is based. For listed species it protects, to the extent that there is funding, ESA attempts to maintain or restore critical life support conditions. A variety of mandated actions are set in motion, including the requirement of a recovery plan for listed species under US jurisdiction and authorization for land purchases or exchanges. Listing also lends greater recognition to a species' precarious status, encouraging conservation efforts by other agencies (foreign, federal, state, and local), independent organizations, and concerned individuals (FWS 2008a).

Under the Act, the federal government can designate “critical habitats,” the habitats necessary to support the species. Critical habitats consist of those areas of land, water, and air space the species needs to survive and recover. Over two-thirds of 1,355 species (Source: US FWS). listed under the Act as of September 24, 2008 depend on habitat located on private, mostly agricultural land.²¹

Restricted budgets in recent years have led to policy initiatives to engage private sector funding, some of which are discussed below. Listing is also a process that is often accompanied by extensive, protracted, and expensive litigation (See footnote 89 in Harbison (2004)). Not surprisingly, many species that may warrant listing under the ESA remain unlisted and without the protection ESA affords.

Agricultural lands are, by definition, lands that have been converted to agricultural use, even if they are temporarily retired, and typically contain fewer attributes associated with original ecological communities than less disturbed landscapes. Yet despite diminished biodiversity, agricultural activity may still incidentally harm (or “take”) a federally listed endangered or threatened species and thus reduce its population. Some landowners must obtain an incidental take permit from FWS, which requires the development of a Habitat Conservation Plan. The plan helps compensate for harm that might occur to the species (Texas Environmental Profiles, 2008).

Under a Habitat Conservation Plan, farmers surrender their right to develop land critical for the survival of the listed species, though retaining the right to develop land not designated as critical habitat. Not many farmers have entered into HCPs (Franklin, 2008),

²¹ Because the protection of endangered species is not synonymous with conservation of biodiversity nor the ecological imperatives of biologically diverse environments—such as maintenance of resilience within a variable environment or importance of keystone species within complex communities, it serves primarily as a warning signal for environmental problems. It draws public attention to trends and conflicts between the natural environment and the man-made and as a driver for policy action that may occur through other federal and state statutory authorities.

a fact that may reflect the scant funding available for compensation for limiting agricultural management.

Over the last decade, FWS has developed alternative approaches to meeting the requirements of ESA that lessen both the financial and administrative burden. One such program - the so-called "Safe Harbor" process - enables landowners to avoid the permitting process. Under this program, a landowner agrees to protect the habitat for a specific endangered or threatened species in exchange for the lifting of future obligations to protect any other endangered species. Another program is the Conservation Bank (FWS, 20003), which, by providing permanently protected or publicly owned land that is managed for endangered species or habitat, creates credits for species or habitat that can be sold to landowners²². The purchase of these credits provides offsets for converted habitat for the listed species. FWS approves establishment and use of credits. Conversely, land used for agricultural purposes can function as a conservation bank if the habitat has been managed or is restored for listed or at-risk species (FWS, 2008b). Monitoring is the responsibility of the conservation bank. As of June 2005, 35 conservation banks had been approved.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 confers federal statutory protection upon migratory birds whether or not they reside on public or private, such as agricultural, land. It also implements the United States' commitment to four international conventions related to shared bird resources. The Act makes unlawful except as permitted by regulation, the pursuing, hunting, taking, capturing, or killing of any migratory bird.

The National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires federal agencies to examine the potential impacts of actions as well as reasonable alternatives to these actions. Impacts that must be considered include hydrologic, ecologic, biologic, social, and health consequences. Actions are broadly defined and include financial assistance programs to private landowners, such as agricultural subsidy programs that can alter the management of lands; construction projects altering the hydrology of an area; or conversion or change in management of land that may have value to wildlife species and habitat (EPA, 2008).

Even though agriculture-related programs and projects are subject to the requirements of NEPA, they nonetheless have always received a waiver from detailed assessment of the environmental impacts. The programs have been defined in regulation as being

²² The emphasis to date has been on preservation, not restoration, though some habitat improvements have been made under conservation banking. (Goble, Dale, J. Michael Scott, and Frank W. Davis The Endangered Species Act at Thirty, Island Press, 2006, pp234-236).

categorically excluded from the requirements of a detailed assessment, called Environmental Impact Statement (EIS). Individual actions, in “extraordinary circumstances,” may still require an EIS (NRCS, 2008).

2.3 Cross compliance regulations

Federal agricultural policy embodied in farm bills provides for direct financial assistance to growers of major commodities, such as corn, soybeans, wheat, cotton, and rice. Some 86% of cropland receives some form of government support (ERS, 2008). As a condition for receiving this assistance, farmers and owners of land upon which those crops are grown must comply with protective conservation provisions. These requirements cover cropland that is highly erodible, cropland that has not been previously cropped but is highly erodible, and wetlands on agricultural lands

These provisions foster protection of water quality and aquatic habitats in streams and rivers draining agricultural lands. Conservation compliance provisions, however, have not prevented the conversion of pasture to cropland (GAO, 2007).

The Wetland Conservation (Swampbuster) provision requires that wetlands that had not been converted before November 28, 1990 or cropped before December 23, 1985 not be disturbed in such a way as to diminish their value and function, with limited exceptions for which environmental services can be compensated, without losing eligibility for benefits. Roughly 93 million acres of cropland are subject to Swampbuster out of a total of 330 million acres (ERS, 2008).

Failure to comply with conservation compliance provisions can result in loss of program payments and even require reimbursement of payment received in the past. The amount of funds from various types of financial support, commodity, disaster assistance, and conservation, are substantial, amounting to billions of dollars per year (ERS, 2008). The rate of compliance with the rules is unclear (GAO, 2003).

In 2005, the US National Organic Standards Board, established by the 1990 Farm Bill,²³ added language clarifying its standards for certification of farms for organic food production that set compliance requirements for biodiversity conservation. These requirements include the incorporation of practices in the farmer’s system plan that are beneficial to biodiversity. Though the total agricultural acreage affected by these standards

²³ *Federal Register* 65, No. 246 (December 21, 2000): 80,563, see also <http://www.ccof.org/pdf/biodiversity/BDGuideOrganicFarmers.pdf> and National Organic Program Rule. <http://www.sarep.ucdavis.edu/Organic/complianceguide/intro2.pdf>.

is relatively small with 4 million acres in 2005 (ERS, 2009), the numbers are growing and indicate a rapprochement with and learning from the EU model.

2.4 Federal programs to restore wildlife habitat on agricultural lands

There are a number of federal laws that establish mechanisms through which wildlife habitat is restored on agricultural lands. These include the following:

Duck Stamp Act

The Duck Stamp Act provides a mechanism for generating money for the acquisition and protection of important migratory bird habitats. The habitat protection authorities of this Act have been significantly modified and strengthened in recent years by provisions of the Wetlands Loan Act and the Emergency Wetlands Resources Act (EPA, 2009).

Pittman-Robertson Wildlife Restoration Act

The Pittman-Robertson Wildlife Restoration Act authorizes federal cooperation with states, through their respective state fish and game departments, in wildlife-restoration projects. The Act conditions the apportionment of federal funds to enactment of state programs for the conservation of wildlife. It authorizes an excise tax on hunting and fishing equipment for funding habitat management and provides grants for hunter education programs and a mechanism for a multi-state conservation grant program.

2.5 Voluntary and financial assistance programs

Beginning with the 1985 Farm Bill, wildlife organizations, federal, state and private environmental interests, and organizations representing farmers coalesced to create federal agricultural programs that effect positive conservation outcomes. Wildlife and biodiversity conservation were at first ancillary benefits to the protection of soil and water resources. With the 1996 Farm Bill wildlife conservation was made an objective of equal importance to soil and water conservation for purposes of funding assistance to farmers and ranchers for conservation. This act and subsequent legislation also created programs specifically targeted toward protecting and restoring wildlife habitat.

Conservation Reserve Program

The Conservation Reserve Program (CRP) established in the 1985 Farm Bill encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to resource-conserving vegetative cover, wildlife plantings, trees, wetland, filterstrips or riparian buffers. The focus has been on grassland that had been converted to agricultural use particularly in the plains states of the central United States. Financial assistance under a 10-15 year contract comprises an annual rental payments based on the non-irrigated

cropland rental value of the land and a cost-share for establishing approved conservation practices.

CRP consists of several parts, the general signup CRP with periodic signup and three continuous signup CRP programs: the Continuous CRP, Conservation Reserve Enhancement Program, CREP, and the Farmable Wetlands Program (FWP). Benefits to wildlife, water quality, and soil protection are equally weighted in the ranking criteria for the periodic signup. Many states provide additional payments to target large blocks of land for permanent retirement. For a portion of the land enrolled in the program that was formerly enrolled in a program called Water Bank (some 600,000 acres), CRP funds are used not to retire the land but rather to purchase water critical for the use of the land for wildlife or preservation of wetlands. For the continuous signup CRP, land that can be restored to riparian buffers and wetlands has priority for enrollment. For CREP, a federal-state partnership, states augment the continuous signup program for land devoted to specific conservation practices, generally of benefit to water quality or wildlife, such as riparian buffers and shallow water areas. It facilitates the targeting of CRP funds to meet state resource needs.

The 2008 farm bill made additional changes in CRP that are intended to improve land cover enrolled in the program to benefit wildlife²⁴. Even though the CRP has proven benefits on the lands enrolled in the program, there is some evidence that these benefits may be at least partially offset by conversion of grassland into farmland (GAO, 2007). And since CRP is a voluntary program, some benefits to wildlife and biodiversity under the current strategy may be ephemeral and dependent upon low global food and feed prices.

Wetlands Reserve Program

The Wetlands Reserve Program (WRP) retires cropland that can be restored to wetlands. Over two million acres have been enrolled into the program with over 80% enrolled under permanent easements, with the remainder enrolled as 30-year easements and cost-share agreements. Projects range in size from 2-acre prairie pothole wetlands to floodplain wetlands of over 10,000 acres. Wetland types that have been or are being restored include biologically diverse wildlife habitat, ranging from bottomland hardwood forests, herbaceous prairie marshes, to coastal tidal salt marshes. Diversity of fish and wildlife habitat conditions is emphasized. Reauthorization of WRP in the 2008 Farm Bill enhances its benefits to wildlife and increases enrollment to over three million acres

Grassland Reserve Program

²⁴ US Senate Agricultural Committee The Food, Conservation and Energy Act of 2008, May 31, 2008 http://future.aae.wisc.edu/publications/farm_bill/wildlife_final.pdf

The Grassland Reserve Program (GRP) helps landowners conserve and enhance the ecological value of grasslands used for grazing and other compatible agricultural uses. Enrollment of two million is authorized under 10- to 30-year rental or permanent agreements and easements. Landowners are required to follow a conservation plan on land enrolled in the program, which generally entails maintaining the necessary habitat for wildlife. Cost share is provided for up to 75-90 % of the restoration and maintenance costs.

Potentially offsetting the benefits of the program has been the conversion of grassland that though classified as agricultural, has been in pasture, not cropland. There is no comprehensive and current source of information in this regard.

Wildlife Habitat Incentives Program

The Wildlife Habitat Incentives Program (WHIP) provides financial assistance to landowners to establish and enhance a wide variety of fish and wildlife habitats. Public funds leverage the restoration of habitat and the on-going costs of practices to manage the habitat.

The Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) provides technical and financial assistance to farmers and ranchers for implementation of practices on working lands that address natural resource concerns, including soil conservation, water quality and quantity, nutrient management, and fish and wildlife habitat. Though not all practices are intended to address wildlife concerns directly, they may nevertheless benefit many species of fish and wildlife. Recent revisions of the law allow for assistance and incentive payments for expanding pollinator habitat for native and managed pollinators in all conservation programs.

The actual benefits achieved through EQIP funding are unclear since there are no clear performance measures. Nor are there consistent monitoring, assessment, or reporting efforts regarding EQIP financial assistance.

Conservation Security Program

Conservation Security Program rewards farmers for environmental stewardship of lands in agricultural production by providing payments for maintaining and enhancing natural resources, including wildlife and wildlife habitat. These working lands include cropland, grassland, vineyards/orchards, prairie land, improved pasture, rangeland, as well as forested land that is an incidental part of an agricultural operation.

Summary of Agricultural Cropland Policy or Program Features

Table 3 shows how the various programs differ according to how they are funded, whether or not they target lands in or retired from production, and how compliance is assessed.

Table 3: Summary of key features of wildlife programs for cropland

Agricultural Conservation Statutory Provision or Program	Mandatory/voluntary	Amount of Land	Compliance Mechanism	Funding mechanism	Retirement/Working Land
Conservation Compliance (cross-compliance)	Mandatory for subsidy payments or organic certification	330 million acres/92% of payments ^{ERS} . ^{2008b} affected	Sample status review ^(ERS)	Linked to eligibility for income assistance or organic certification	Working lands
Conservation Reserve Program	Voluntary	33.6 million acres in 2009	Assessment upon renewal	Entitlement with acreage limitation	10 to 15 year retirement from agricultural production
Wetlands Reserve Program	Voluntary cost-share	3 million acres authorized	Assessment upon renewal	Entitlement through acreage limitation	Permanent and temporary retirement from agricultural production
Environmental Quality Incentives Program	Voluntary cost-share and incentive payment		Assessment upon renewal	Entitlement with total funding limitation	Lands in agricultural production
Wildlife Habitat Incentives Program	Voluntary cost-share	2.8 million acres enrolled as of 2005	Assessment upon renewal	Annual appropriation	Lands in agricultural production
Conservation Security Program	Voluntary incentive payment	10 million acres as of 2005	Self assessment	Annual appropriation	Lands in agricultural production
Grassland Reserve Program	Voluntary cost-share	870,000 acres enrolled as of 2006	Assessment upon renewal	Annual appropriation	Lands in agricultural production

Other incentive-based policy instruments

Farm Bill establishes a tax deduction for the cost of actions to implement site-specific management measures included in recovery plans under the Endangered Species Act. This provision is effective for expenditures paid or incurred after December 31, 2008. More than 10 million acres of conservation easements are held by land trusts nationwide, many of them donated. The charitable tax deduction for conservation easements serves as incentive for making such gifts and conserving valuable land.

Partnering programs

Under the array of tools authorized under the 2002 and earlier farm bills, conservation easements on agricultural lands, including rangelands, have been negotiated by national non-governmental organizations. Combined efforts have conserved over 20 million hectares of rangeland. In addition, local and regional land trusts hold conservation easements on over 2.8 million hectares of private, generally rangelands in the arid and semi-arid western states (Havstad et al, 2007).

Under the 2008 farm bill, the new cooperative conservation partnerships initiative, six per cent of conservation programs including CSP, WHIP, and EQIP is set aside for cooperative conservation partnerships, allowing states and local governments, and nonprofit groups, to utilize program resources to address resource concerns in a comprehensive manner. This program represents an opportunity for the wildlife community to address habitat needs through the use of multiple conservation programs.

2.6 Verification

Piecemeal policy that has been assembled over generations does not guarantee that biological diversity is maintained if not enhanced. Incentive programs, such as those overseen by the United States Department of Agriculture, may be successfully implemented, yet because of countervailing policies and trends outside of the administrative jurisdiction of the agency, wildlife goals and objectives may not be attained. Nor can there be complete confidence that a practice implemented at the farm or field level will produce targeted goals at an ecosystem or higher geographic scale given the myriad factors that can complicate efforts.

Collaborations between wildlife scientists among government agencies since the 1990 farm bill have documented (measuring and quantifying) the response of some wildlife species populations to habitats created by farm bill conservation programs, particularly the CRP (Heard, 2000; Haufler, 2007).

Since 2002, a multiagency federal taskforce has overseen the assessment of the effectiveness of conservation programs on agricultural lands, covering not just cropland but grazing lands as well (The Wildlife Society, 2005). Workgroups overseen by the taskforce engage non-profit organizations and academic institutions as well.

Though not expressly targeting wildlife and biodiversity, these issues are covered as well. Bird species have been a particular focus as an indicator of diversity, but other wildlife

populations are assessed as well. The evaluation includes efforts to protect wetlands and their functions that are protected or restored on agricultural lands²⁵.

3. Comparative analysis of the two policy approaches

Measures for wildlife conservation and agriculture

Both the EU and the US have shown a commitment to protecting and enhancing nature conservation on agricultural land through a smorgasbord of mandatory, quasi-mandatory and voluntary measures. At the community level, the EU and the US,

- set horizontal mandatory baseline standards (nature conservation legislation, as well cross compliance where standards have a quasi-mandatory character for farmers receiving direct payments). Strategies and action plans formulated at EU level influence national strategies.
- provide or co-finance funding for voluntary incentive measures, and thus influence their design and the allocation of these funds. This constitutes an incentive – or even an obligation in case the offer of such measures is mandatory (e.g. AEM in the EU) - for EU member states and US states to implement measures for wildlife protection on agricultural land.

Regarding the **baseline for the mandatory protection** member states and regions in the EU or states in the US may exceed this protection, but not make exceptions. In the EU, relevant species and habitats are scientifically determined and agreed upon; the declaration of resulting “Natura 2000 areas,” a key element of European nature conservation policy, is binding for the member states. While EU-funds provide cofinancing for compensatory payments or voluntary incentives for the management of Natura 2000 areas, the means of protection are at the discretion of the member states. However, funds for such measures may not be sufficient. In the US, identification and listing of species and “critical habitats” for their support lead inter alia to the implementation of recovery plans along with federal financial support and state government requirements for protection. However, listing is constrained by funds available with many species remaining unlisted. Federal funding constraints have led to policy initiatives to engage private sector funding. State and federal partnerships serve to develop measures for the conservation of listed species.

²⁵

By integrating design, management, and monitoring in a systematic manner to test inevitable assumptions that underlie all conservation efforts, Adaptive Management provides a means for learning what works and what does not and for establishing benchmarks or measures for success. It provides a means for dealing with the uncertainty inherent in managing natural ecosystems under conditions that are not controllable by resource professionals. Though long used in fisheries management, it has only recently been introduced to agricultural conservation.

Cross compliance preconditions the full receipt of direct payments allocated to farmers or eligibility for labeling in the case of organic production. In the EU the vast majority of farmers are eligible for direct payments, and thus these cross compliance standards, including standards for land management, apply nearly everywhere. In the US, cropland or agricultural land that may be subject to cropping is covered by cross compliance. In both cases no area-specific management concerning wildlife conservation is delivered through cross compliance with the exception (US) of lands certified for the organic food label. However, wetland protection covered by cross compliance does ensure a level of “top-down” federal protection with federal enforcement for those agricultural areas that still maintain wetland function. Whereas the US federal government can curtail subsidy payments for non-compliance, this happens in the EU through the member states. The EU can withhold direct payments allocated to member states in case of insufficient enforcement of cross compliance.

Biodiversity conservation requires locally adapted land management. **Voluntary incentives** are a prominent feature of wildlife conservation related to agricultural land. In both the EU and the US, such cooperative approaches with land managers are used to target support to specific area and management beneficial for wildlife. The EU offers AEM that require cofinancing by the national member states or regions, and implementation is obligatory for member states. The US, on the other hand, provides a suite of conservation programs, with mostly federal funds, administered by the US Department of Agriculture tailored to a wide variety of agricultural and financial circumstances. Nevertheless, budgetary constraints and high market prices for commodities limit effectiveness. In both cases, funding solely at lower government levels allows for flexibility for the design and implementation of additional measures.

The EU requires that each member state allocates a minimum percentage of its budget for rural development to measures for “improving the environment and the countryside”, among them AEM. The design of measures, their target areas and the allocation of funds on different measures are left to the discretion of national and regional administrations, but requires approval at EU level. In the US the federal government decides on the type of practices, their locations, and the species that will be funded. States can suggest practices and identify priority lands, which must then be approved by federal authorities. In some cases, state committees, with federal oversight, decide how the agricultural conservation funds are spent and where and advise which practices are employed²⁶.

With regard to the **involvement of stakeholders** other than the agricultural administration, the degree of EU cooperation and collaboration with regional and local administrations, as well as with environmental administrations and civil society organizations varies. There is a tendency towards more involvement notably in the design of nature conservation

²⁶ CREP: federal-state partnership that facilitates the targeting of CRP funds to meet state resource needs

measures by the environmental administration, and more participation of lower level government and non-governmental stakeholders. In the US partnering with state and local governments, along with non-governmental organizations, plays an ever greater role in protection strategies. NGOs provide advice on priorities for both the federal government and state governments, advise on practices that are employed and assess the effectiveness of various interventions.

Regarding extensive farming or long-term retirement of land

Biodiversity oriented measures in the EU rely heavily on extensifying farming and creating or maintaining small-scale landscape structures to enhance wildlife on agricultural land. Traditional, less intensive agricultural practices in Europe provide habitats for species that do not persist in intensively managed farmland nor in nature areas. Extensification includes restriction of inputs and adoption of wildlife friendly management such as late mowing of grassland. Nature areas and forest are well protected by legislation against conversion to agricultural land. On the other hand agricultural land may be converted to nature areas, causing them to lose eligibility for direct payments. Thus such a change involves high opportunity cost. Some agricultural land may be purchased purely for nature conservation, e.g. by nature conservation trusts, and funds exist for the creation of field strips or other landscape elements, such as hedges, or for long-term set aside (10-20 years) in some EU member states. The amount of land potentially affected is however small and the acceptance by farmers is low.

The US initially focused on permanent or long-term retirement of agricultural land, especially cropland to meet wildlife conservation objectives. Federal laws established mechanisms through which habitats could be restored on agricultural lands and the means for generating the funds, both public and private, for that purpose. More recently, emphasis has shifted to financial incentives and market-based approaches to induce voluntary rather than mandatory participation in conservation programs. In the case of organic foods, eligibility for labeling that confers a market advantage. Agricultural policy has provided for temporary (10-30 year) and permanent retirement of agricultural land from intensive agricultural use. Thus, the US approach has largely been to create wildlife habitat on agricultural land as opposed to the EU's nature conservation policy, that focuses on low-input farming systems amenable to wildlife. As in the EU, the opportunity cost of removing more land out of agricultural use shifts the policy focus to management of lands that remain in agricultural use ("working lands") for wildlife benefits.

4. Conclusions

Policies relating to agricultural land and programs to implement these policies affect the management of large expanses of land and involve large public budgets. How the funds

are distributed is coming under increasing scrutiny in both the EU and the US. Justification for public funding is shifting from income support to management of agricultural land in ways that provide clearer public benefit. Conditions are being imposed on how funds from the agricultural budget are expended to ensure environmentally friendly land management. Linking of funds to environmental and conservation criteria enables a “top-down” approach to more consistent program design and better coordination and a horizontal approach to targeted, landscape-scale or regional implementation of measures that address local or regional needs.

In the EU member states agree on common strategies and (minimum) objectives, and EU funds are provided to address common objectives. This kind of harmonization increasingly encompasses regional and local activities as well. Member states have considerable discretion for defining individual measures, though these still have to be approved by the EU and controlled, monitored and evaluated according to EU requirements. This assures a degree of transparency and consistency regarding justification for measures and the allocation of public funds to support these measures.

The growing importance of AEM especially in the EU has induced concern about hidden income objectives (Hofreither, 2000), and has led to ever more discussion of trade-distorting effects, e.g. by supporting livestock production for grazing. There is a need for agreed-upon criteria in order to distinguish environmental support measures from trade protection. This requires linking these measures to clear environmental objectives, to establish the necessity of intervention, to prefer least trade-distorting measures and to document their effectiveness by monitoring and evaluation (Ervin, 1999; Gay et al, 2004).

The US set of policies support biodiversity in a piecemeal and loosely coordinated manner with mandates and programs cobbled together. It stresses cooperation among government, private landowners and farmers, and non-profit organizations to protect specific wildlife species with federal funding leveraging private and state efforts. Such an effort involving so many entities and generally entailing loosely if not uncoordinated projects and programs push the limits of organizational and scientific knowledge. Measures, particularly voluntary, may not achieve desired outcomes on a landscape scale or as necessary for the biological components of diversity. On the other hand, the cooperative approach allows for experimentation in what works at both a policy and scientific level since restoration of the conditions that prevailed under pristine states is rarely possible. Its focus on measurement of the desired outcomes associated with biodiversity, though imperfect, does provide a scientific basis for government farm level support.

Public expectation that land converted to agricultural use will regain the biodiversity of its pristine state may be scientifically or economically unattainable. Here the US could learn from the EU with regard to setting realistic goals and blueprint for the management of agricultural lands.

In light of the scientific uncertainty, this latitude in both the EU and US systems to allow for experimentation justifies the considerably high administrative burden of both systems. Managing the “commons”²⁷, a dilemma that conserving biodiversity represents, poses a policy challenge that evolves just as society and its institutions change. Flexibility in policy allows for identification of approaches that improve effectiveness and the efficiency of measures. This evolution includes the identification of suitable vertical levels for their implementation, a better coordination between measures and accounting for further environmental issues beyond biodiversity.

Mutual learning and cooperation

In the field of nature conservation and agricultural land use common challenges for the EU and the US can be identified, where mutual learning processes and an exchange of experiences on “good practice” in policy design and in monitoring and evaluation could be beneficial:

Public support for multifunctional farms does not guarantee biodiversity nor does public support for restoration of habitat for specific species. An increasing emphasis on using “public money” to deliver “public benefits” demands the development of a much stronger evaluation culture in order to examine the effects of financial transfers to farmers and to verify environmental benefits of cross compliance and voluntary incentive measures. This is not only to internally justify public funds being spent, but as well to defend measures towards the WTO. Both systems can benefit from the development of scientific tools to measure biodiversity outcomes and analytical approaches to assessing the effectiveness of measures at various geographic scales, perhaps through mutual collaborations and exchanges of data and knowledge.

Cross compliance is an area where the EU has learned from the US. The EU, however, has also learned from the US that reducing these payments also reduces their influence on farm behavior. Lower payments increase the possibility that farmers forego income support not to be affected by cross compliance. This instrument has to be adapted to the payment scheme or substituted by mandatory or incentive measures.

The US has learned and adopted from the EU policies that encourage less-intensive, multifunctional farming systems that are more compatible with wildlife and biodiversity. The percentage of federal dollars devoted to farm income support for such farming practices grows with each reauthorization of farm legislation.

²⁷ See Garrett Hardin, "[The Tragedy of the Commons](#)", *Science*, Vol. 162, No. 3859 (December 13, 1968), pp. 1243-1248.

Both the EU and US policies are shifting towards greater reliance on voluntary support to achieve biodiversity. The instruments will however have to be reassessed since their effectiveness is compromised by high commodity prices and increasing demand for food and energy crops. If indeed there is public support for achieving environmental objectives linked to land use, there is no avoiding the issue of mandatory measures versus voluntary incentives. The amount of incentive payments to achieve desired social ends challenges the current distribution of agricultural funds. So far the public pays twice, once for largely untargeted flat-rate farm support, and once for environmental protection on agricultural land. Mandatory standards with or without compensatory payments enable area wide implementation, in contrast to voluntary incentive measures that depend on the farmer's willingness to participate. However they can be difficult to enforce and can lead to unanticipated perverse consequences. Incentive measures, on the other hand, are called for situations where farmers should be encouraged to provide specific nature conservation services or to continue farming, where such use of the land is desirable from a nature conservation perspective.

The challenge is to develop a land use policy that takes into account multiple objectives (such as the production of food and raw materials as well as climate, water and biodiversity protection) and where and how these are most effectively reached. Both approaches, integrating biodiversity protection into agricultural management on the one hand and converting land to nature area in the long term on the other, have to be discussed under this context. The US has the luxury of having land that is publicly administered or private lands that can be returned to some semblance of its original biodiverse state. Its agricultural lands can be managed for wildlife biodiversity with ancillary benefits to biodiversity. The EU has ample experience in how to encourage management of agricultural land for a multiplicity of uses that can be of value to the US. Both the EU and the US can benefit from improved metrics for biodiversity for lands maintained in agricultural use. Given the different historical contexts the functional definitional differences will likely remain. Greater collaboration between the EU and the US could help in developing the monitoring and assessment tools to understand these differences, to share scientific information practices and management experience and to improve overall effectiveness and accountability of public funds.

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