

The EU's Agri- Environment Regulation No. 2078/92. Examples of Environmental Benefits

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**The EU's agri-environmental Regulation No 2078/92. Case Study: European Union
Part II: Examples of Environmental Benefits**

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SUMMARY

The open, non - forested, component of the European land area, which ecological evidence suggests is more ancient than often realised, together with the long history of farming in Europe, have provided continuity and stability for plants and animals to adapt their often complex lifestyles. Certain management now maintains spatial and temporal biodiversity, at a variety of scales, on farmland within which a whole range of ecological and behavioural processes are operating. Detailed examples are used to describe this in more detail.

Although the ecological conditions on farmland are often complex (involving interactions between management practices, plants, invertebrates, birds and mammals) it is clear that relatively simple adjustments to routine farming operations can provide and maintain farmland high in biodiversity.

Policy instruments such as Regulation 2078/92 should, in principle, therefore be capable of achieving real environmental benefits which are both sustainable and cost-effective. Indeed, without an ability to maintain certain styles of farm management across a wide range of farming systems, it will be difficult to conserve many of Europe's most threatened plant and animal communities; or even to meet the European Union's nature conservation objectives within the Wild Birds Directive and the Species and Habitats Directive.

Introduction

This paper is complementary to the one presented by the European Commission on the agri-environmental measures in Europe as established under Regulation (EEC) which describes what the policy is and how it is operated. The aim here is to give some examples of what Regulation 2078/92 means on the ground, particularly the potential it has for achieving environmental benefits and why an agricultural policy of this kind is needed to sustain what used to be termed nature conservation and what today is more fashionably called biodiversity.

But before focusing on some detailed examples there is a much more general question which perhaps should be addressed, namely, do we really need agriculture policy measures to achieve environmental benefits?.

There is increasingly a view that, from a scientific perspective attempting to be objective in its assessment, the answer is an unequivocal yes, particularly where the current development of agriculture threatens the survival of farming systems of high biodiversity and landscape value.

This may be a situation which is particularly true of Europe because of this continent's long history of farming and also because of its high human population density. The antiquity of agricultural practices across much of the continent of Europe has important ecological implications. The concepts of ecological stability as well as the predictability of dynamics or perturbations are important in explaining the distribution of plants, animals and biotopes, the productivity of species and populations and the ecological adaptations to environmental conditions (e.g. Garcia 1992, Austad et al 1991, Crawford 1990). In land management terms this concept of ecological stability is usually associated with continuity of management, and there are some very good examples of current European farming practices which have their roots in ancient farming systems and long established management practices.

The origins of European open habitats

There is a widespread assumption that forests are the natural vegetation cover in western and central Europe and that open spaces, mostly grasslands of various types, were always very rare; being maintained by large herbivores, beavers and natural catastrophes such as fires, landslides, snow slips etc. (Ellenberg 1986). This stems from the conventional palaeo-ecological view that in post-glacial Europe forest spread northward in the wake of the retreating tundra until it clothed the landscape from the Mediterranean north to the limits of climatic tolerance.

However such a large proportion of Europe's wildlife is morphologically or behaviourally adapted to open habitats that this reconstruction is plainly flawed.

To persist and evolve, the plants and animals of open habitats (grasslands, plains, wood pastures etc..) would demand more than the rare open spaces envisaged by Ellenberg. Accordingly, other authors (Geiser 1983, Van Dijk 1996, Tubbs 1996) all suggest that the open component of the European landscape was far more important than supposed so far, as has been the role of large herbivores, some of which are now extinct

Neither bustards nor vultures, both now viewed as "flagship species" in Europe, could persist in a forest environment and moreover they require very extensive open landscapes. The same can be said for most of Europe's rich steppeland, upland and mountain plants and animals. Even many woodland species (e.g. lichens) are very light demanding. Many insects have complicated and bizarre life cycles which could only have evolved in open conditions - the symbiotic relationships between the blue butterflies and some ants are examples. The importance of open ground is further underlined by the high number of species relying on these habitats. For example, in the former West Germany, Korneck and Sukopp (1988) have listed 588 species of higher plants and ferns in dry grasslands (steppes) and 297 in wet grasslands (marshlands); Holzner et al (1986) list 1041 species of insects in Austrian dry grasslands, of which 85% are now Red List species (see van Dijk 1996).

Logic points to the development of a more diverse, ecologically more chaotic landscape than the neat progression from tundra to forest. Perhaps more realistic is a mix of woodland, heathland, grassland and wetland, occurring regionally in extensive tracts as well as in more intimate mosaics. Within these habitats grazing and browsing by wild herbivores would have created and maintained the open component of the landscape. This explains the need for continued grazing pressure to maintain habitats of European importance today.

The development of extensive farming

The precise nature of the open habitats in the early millennia of the post glacial will remain largely conjectural. In any event, from Neolithic times they were modified into a rich variety of farming ecosystems, as was most of the forest. Ultimately, these included the croplands, meadows, wood pastures, coppices and other habitats which derive most obviously from continual human intervention. The moorlands, mountain pastures, steppelands, saltmarshes and other "wilderness" lands derived much of their present character from extensive pastoralism. Commonly this involved annual transhumance between lowlands (winter) and upland (summer) pastures. The appropriate management of these semi-natural habitats is one of the primary aims of the conservation orientated measures being undertaken within the framework of Regulation 2078/92.

Transhumance - an example of an ancient European agricultural system

Transhumant agricultural systems, both in the south and the north of Europe, provide good supporting evidence to this historical perspective (Bignal 1991, Ruiz & Ruiz 1986, Bil 1989).

Transhumance evolved in widely separated geographical areas of Europe as a method of exploiting seasonally available pastures in mountains and lowlands, often involving the movement of great numbers of livestock, mostly sheep and cattle.

In Spain this agricultural practice originates from the 6th Century (Klein 1920), was well developed by the 8th century and by the year 1273 Alfonso X had established a national livestock association (Honrado Concejo de la Mesta) defending the rights of livestock raisers undertaking transhumance across Spain until its abolition in 1836. This organisation had equivalents across the Mediterranean countries, for example the Dogana in the Apulia - Apennine region of Italy (Grigg, 1974). Transhumance continued in Spain after 1836 (to the present day) but without the special structures provided by the Mesta to defend its privileges.

In Scotland the earliest surviving written documents referring to transhumance date from the 12th century (Barrow 1981) and this pastoral-based agrarian economy persisted through to the 17th and 18th centuries gradually being replaced by more sedentary livestock rearing and cultivation and permanently inhabited farmland.

The point that these two examples make is that a sizeable proportion of the agricultural land in Europe, which is today regarded as being of high biodiversity, has its origin in a pastoral agricultural practice dating back for over 700 years. In many areas these practices only began to decline less than a century ago and in some places they still survive little-modified to the present day.

So, at the landscape scale, transhumance developed and maintained over several centuries, has shaped the character of vast areas of the Mediterranean landscape, namely:-

- [1] The mountain pastures, often well above the natural tree-line, maintained by the regular summer grazing.
- [2] The fallow lands adjacent to the drove roads (known as Las Cañadas in Spain) where the manure from the migrating livestock contributed to the fertilisation of periodically cultivated ground.
- [3] The drove road itself; essentially a meandering elongated pasture-land, floristically quite distinct from surrounding areas.
- [4] The winter grazings, in particular the steppes and the dehesa (Spain) and the montado (Portugal) - the open savanna like woodlands of cork oak and evergreen oak.

European farmland, biodiversity and agriculture policy

There has been great diversity in the ways in which farmers in Europe have responded to physical circumstances and climate over a long period of time. However the cultural landscapes which we now value and increasingly attempt to protect evolved as low-input, low-output, usually labour intensive, but sustainable, systems of farming often high in biodiversity. Many plants and animals of the more ancient open landscapes and habitats, proved capable of adapting to these semi-natural conditions. Indeed, in modifying the landscapes from which they derived, these farming systems may have increased plant and animal diversity at a local level. They have also existed for longer than the primeval forest which most interpretations of pollen analysis would have us believe spread across Europe in the wake of the retreating ice in the early millennia of the Holocene. Because of the great regional diversity which they display across the continent, European low-intensity farming systems have a unique contribution to make to world biodiversity. In addition, even Europe's more intensively managed farmland, now of limited natural value, has its origins in the same ancient agricultural systems and retains fragments of the former agricultural landscape.

Since the middle of the 20th century, the high biodiversity agricultural landscapes which had remained little changed for centuries, have diminished before the assault of agricultural intensification involving high inputs of chemicals and fertilisers, increased mechanisation and the spread of low biodiversity farm monocultures which have swept aside ecological variation. It is the fragmented relicts of the former systems (heathlands, chalk and dry grasslands, meadows) which are now so hard to manage as nature reserves or special sites; for example in all the lowlands around the north sea where intensification has largely detached modern farming from the slow evolution of the past.

However, low-intensity farming systems do remain widespread in Europe as a whole. A recent survey of nine European countries revealed that there remains more than 30 million hectares of extensive pastoralism alone (Beaufoy et al 1994). Traditional small-scale mixed farming, low-intensity production of olives, fruit, cork and other products and non-irrigated systems of arable farming in dry lands - generally involving extensive fallows, and low or nil inputs of fertilisers and agro-chemicals, also remain widespread. Within the EU these systems are mainly in the Mediterranean biogeographical region and in the mountain, upland and coastal areas of the Atlantic biogeographical region. The British Isles and large parts of France are exceptional in western Europe in having some of Europe's most widespread and botanically most important grasslands.

Small sites can be protected effectively as nature reserves if the resources are available. However, at the regional and landscape scale the best prospect of maintaining the mixture of vegetation features and management operations in areas of high biodiversity is mostly through appropriate agricultural management. It is the farming operations in these areas that create the variety of spatial and temporal conditions needed by wildlife. However most traditional practices, although ecologically sustainable, are not economically viable in a purely production orientated system - where the pressures of intensification and increased mechanisation are ever present. In the areas where high biodiversity low-intensity farming systems survive intensification often is not the main threat. Over large areas the principal pressures on agricultural management are marginalisation, abandonment and redeployment of farmland as a consequence of the ever reducing economic viability of outdated farming practices.

Achieving biodiversity aims on farmland therefore requires:

- (i) Measures to ensure the continued viability of farming systems which give rise to appropriate forms of land management.
- (ii) A means of persuading farmers to maintain or adopt specific practices which meet the requirements of particular habitats or species.

Thus there are clear linkages between environmental, agronomic and socio-economic problems. In the past these have been addressed in a relatively crude way by both national and European measures such as the Less Favoured Areas (LFA) Directive which provides compensatory payments to ensure the continuation of farming in these areas. However, it is only recently that the environmental importance of particular farming systems has been directly addressed by Regulation 2078/92 and similar measures. These are agricultural or agri-environmental policy measures.

Several policy measures, both national and European, have historically addressed these economic, social and production problems (e.g. LFA Directive and the various livestock support regimes) but it is only recently and currently that the environmental importance of these systems has been directly addressed (e.g. by Regulation 2078/92). Purely from a nature conservation or biodiversity conservation perspective it would be unrealistic to influence the management of tens of thousands of hectares of land through, for instance, acquisition and nature reserve management. Even ignoring the conservation management difficulties, the social implications alone would be enormous. Realistically the only feasible option, at least in the short term, are measures which seek to encourage the appropriate agricultural management practices. To effectively achieve this, measures are needed which firstly maintain the *status quo* in farmland of high biodiversity and secondly maximise the

contribution that farming can make. To do this an understanding of the ecological relationships on farmland is needed.

Understanding and managing the ecological relationships of farmland.

One of the challenges facing the development and refinement of a European agri-environmental policy is the wide range of variation and conditions that it must address across the continent. As well as strong north-south and east-west differences in plant and animal distributions, altitudinal, topographical and geological factors also affect both distributions and abundance. At the farm and field scale small changes in management practices such as cropping patterns, mowing dates and grazing regimes can cause significant changes to the ecological conditions required by certain plants or animals. Some examples are given below.

The marsh fritillary butterfly *Eurodryas aurinia*

The marsh fritillary butterfly is a species which is facing extinction right across Europe and one which has its strongest populations in the UK. The butterfly is on the wing for only a short period during May or June when the temperature is high enough and wind speed low. Adults lay their eggs on the underside of the leaves of the larval foodplant, devil's bit scabious *Succissa pratense*, where three weeks later they hatch to form colonies of caterpillars. Soon after emergence the caterpillars spin a dense web over the foodplant, beneath which they live and feed, moving to another plant when the first is consumed. During August a more substantive web is constructed, inside which they hibernate, emerging the next Spring to bask on sunny days and recommence feeding. They eventually disperse from the colony having spent about ten months in the larval stage. The caterpillar pupates close to its foodplant and hatches about a fortnight later.

In Britain the marsh fritillary butterfly is a species of the heathland and acid grassland pastures of western Wales and western Scotland. A recent survey in Scotland (O'Keefe pers. comm.) found that the height of the vegetation where caterpillars were found in mid-summer (from larval sites marked in the Spring) ranged from 11-35cms but that 80% of sites were within a narrow range of 11-14 cms. These heights were significantly different from a random sample of vegetation heights in the areas examined suggesting that the caterpillars had preferentially selected this height sward.

The vegetation within which eggs and caterpillars were found occurred as a mosaic of wet heathland and grassland which was maintained by extensive grazing by cattle. All UK colonies show similar attributes with the optimum conditions being a summer sward height of 11-14cms, abundant *Succissa pratense*, in an area where the vegetation structure gives the butterfly and the foodplant shelter without dense shading.

These conditions are provided on pastures where the vegetation of grass and heath is maintained by the routine seasonal grazing pressure of cattle and sheep managed in an extensive system. Sheep grazing alone, supplemented by periodic burning (a common management regime today requiring less labour) did not provide suitable conditions, instead leading to heather monocultures and short sheep-grazed grassland.

In areas with optimum grazing pressure for this species the low density of grazing animals, primarily cattle, ensures that the risk of livestock trampling the colonies of caterpillars is low yet at the same time the grazing pressure is high enough to remove the coarse vegetation growth, favour the foodplant and produce the optimum height of vegetation.

This example illustrates the importance of a specific grazing regime for a species of European conservation importance. As economic and technological conditions change, it will become

difficult to persuade farmers to pursue this management option without offering incentive payments.

The red-billed chough *Pyrrhocorax pyrrhocorax*

The chough is a rare bird listed on Annex I of the EC Wildbirds Directive. It has a fragmented distribution in Europe. Over half of the estimated minimum European population of 16,000 pairs is concentrated in Spain, Greece and Italy; most populations are small and many are declining (Tucker and Heath 1994). Choughs feed principally on soil-living, surface active and dung-associated invertebrates which they obtain from extensive pastures (i.e. managed at low intensity) grazed by sheep, cattle, horses and goats. Optimum feeding conditions can occur in a wide range of arid to temperate vegetation with bare ground and short or open vegetation cover. However studies in the Scottish Hebrides (Bignal et al 1996) have shown that there are (i) different foraging strategies between breeders and sub-adults and non-breeders, (ii) seasonal shifts in diet through the year, and (iii) critical periods during which conditions limit population recruitment to below the level at which it can meet mortality.

The Scottish study found that the seasonal abundance and availability of the main items in the chough's diet are influenced predominantly by agricultural management operations: cereals are obtained from stubble fields, cattle feeding stations or cattle dung from October to April; fly larvae are taken from pastures between January and April and in large numbers in July; insects are obtained from cattle and sheep dung during spring and in late summer and autumn; and during high summer, a wide variety of surface invertebrates are consumed from the pastures.

During the periods of incubation and rearing nestlings the adults selected grass pastures preferentially to other biotopes for foraging and fed predominantly on cranefly larvae (*Tipula* spp.). The abundance of *Tipula* larvae in the soil was found to be related to the agricultural management of the fields. The fields used preferentially by the birds in 1992 were those in which (i) management during June to September 1991 produced medium to high grass swards, either through a low stocking density of cattle or the growth of silage or hay crops for late mowing, and (ii) intensive grazing by sheep and cattle between January and May 1992 reduced the vegetation markedly. The former producing optimum conditions for adult craneflies to oviposit (in tall grass) and the latter optimum feeding conditions (short vegetation, bare ground) for foraging choughs.

Although weather conditions in autumn and spring can affect *Tipula* populations, and are largely beyond control, in many years the manipulation of pasture management could have a beneficial effect on nestling survival and subsequent population recruitment by creating optimum conditions at a critical time..

The rather complex ecological conditions required by this rare European bird can most effectively be provided using very straightforward and routine farmland management activities timed to produce the desired conditions. As traditional forms of management become less cost effective incentive payments are becoming more important as a means of ensuring the continuation of previously routine farming practice.

The Corncrake *Crex crex*

The corncrake is a globally threatened bird which is a summer visitor to northern Eurasia and winters in south-eastern Africa. It frequents tall vegetation throughout the year and in the breeding season is strongly associated with grasslands managed for hay and silage.

The requirements of the corncrake are vegetation cover which develops through the spring and summer to conceal and protect the birds their nests and their young, together with a diversity of invertebrates on which adults and young can feed. These conditions were traditionally provided through a combination of the vegetation of damp grasslands and the edges of marshes in spring and fields cultivated for hay and cereals in summer. The small-scale of cultivation and the gradual harvesting of grass and cereals provided a patchwork of safe refuges and feeding areas through the summer months for adults and young (most females attempt to rear two broods). The tall summer vegetation cover was in many parts of Europe associated with local transhumance which removed the grazing pressure of domestic livestock around cultivations and meadows and concentrating it on the summer hill pastures. As mechanisation and field size increased, fertilisers changed the botanical composition of grasslands and advanced the mowing dates and livestock rearing became more intensive the ecological conditions required by corncrakes have been eroded.

Corncrake numbers have been declining and its distribution contracting since the 19th century (e.g. Broyer 1994) and this decline can largely be attributed to the intensification of grassland management.

Examples of Policy support for ecological management

Regulation 2078/92 has a rather wide range of objectives and there is a great variety of measures being introduced across the Member States.

Here I want to focus on three examples of how the Regulation aims at achieving ecological benefits, at different scales, through influencing farming management practices.

[1] A landscape scale measure - Maintaining grazing in Extremadura, southwest Spain

Over the last 20 years there have been considerable changes to the agriculture of this Region resulting from the effects of rural depopulation and the marginalisation of traditional agricultural systems. The resultant development of scrub and woodland has created a major problem with the accumulation of dry vegetation leading to high fire risk and potential for resultant erosion. Wildfires are a major environmental problem in southern Europe, where hundreds of thousands of hectares of scrub, heath, grassland and farmland are burnt each year. Slopes that are left unvegetated after fire are highly vulnerable to erosion during the winter rains. These problems are particularly apparent in areas where livestock grazing has been abandoned through the marginal economics of farming or through conversion to commercial forest through State forestry schemes.

The two measures outlined below are both very new and form part of the zonal programme for Monfragüe natural park in Extremadura. Their aim is to maintain extensive livestock grazing with the principal objective of fire prevention and countryside (landscape character) conservation; but the measures could potentially have wider ecological benefits by sustaining the mosaic of open grasslands and Mediterranean woodland and scrub.

This mixture of vegetation is the habitat of a wide range of species of reptiles, amphibians, plants and mammals. These include some of Europe's most threatened species including the Imperial eagle (*Aquila heliaca*), the Black vulture (*Coragyps atratus*) and the Iberian Lynx (*Felis pardina*) the world's most endangered feline (IUCN). Confined to the Iberian peninsula

(the total population is estimated at no more than 800) the remaining populations occur in upland areas where extensive livestock raising is present (but dispersed) and where the landscape is composed of approximately 40% open grasslands (the hunting areas) and 60% woodland and scrub (for seclusion and security), see Oberhuber 1995. For the Lynx these landscape measures could complement other more specific local conservation measures which would become more effective in the context of the broader landscape management.

(i) "Conservation of the countryside and fire prevention with extensive grazing systems".

Within this measure conditions include maintaining an average stocking density of between 0.2 - 0.4 Livestock Units/hectare (LU/ha) and ensuring continual grazing between 15 April and 15 July with at least 0.3 LU/ha. Scrub clearance is permitted where scrub exceeds 15% of the holding.

Annual payments for grazing are 9000 pta/ha (£45/ha) + 20% for native breeds and 30,000 pta/ha (£150) for scrub clearance.

(ii) "Maintenance of abandoned land"

Holdings are eligible if they are close to forested land and have been abandoned in the previous five years. Where land is to be managed by grazing this should be at between 0.15 and 0.3 LU/ha. Scrub clearance is also permitted. Different conditions apply to the management of permanent crops where grazing is not foreseen.

Annual payments are for grazing 7000 pta/ha (£35/ha) and for scrub clearance 30000 pta/ha (£150/ha).

A major challenge in the conservation of large mobile mammals and birds which require extensive foraging areas, such as the Lynx, Black vulture and Spanish Imperial eagle, is preventing the fragmentation of habitats and populations; for example in the Sierra Morena in Andalucia, SW Spain (Ales 1996).

In most cases abandonment or redeployment (often to forestry) of marginal agriculture land has taken place in association with intensification of agriculture in neighbouring better areas; resulting in loss of habitat diversity on a scale that these species require. This is a widespread pattern taking place across Europe.

For many of these species the most effective land management strategy, certainly in the short term, will be through maintaining a low-intensity, extensively farmed landscape (and preventing either inappropriate intensification or large-scale abandonment) with woodland and scrub providing seclusion and isolation and open ground foraging and feeding areas. Potentially the kinds of measures outlined above could make an important contribution but to achieve greatest benefit they need to be applied widely (the example above is restricted to the Monfragüe natural park and Extremadura Special Protection Areas) and to have larger resources.

2. *A habitat measure - Maintenance of grasslands in Causse Mejan, France*

The Causse Mejan is a plateau of calcareous grassland in Lozere supporting steppeland birds including the Little bustard (*Terax terax*), numerous species of invertebrates, including the increasingly rare Apollo butterfly (*Parnassius apollo*) and the Southern damselfly (*Coenagrion mercuriale*) which is listed in the Species and Habitats Directive.

In this area, in the face of economic difficulties, many farmers have increased production concentrating particularly on producing sheep's milk for Roquefort cheese. At the same time farm amalgamation and the concentration of production onto the best farmland has lead to the abandonment of around 1000 hectares of farmland. Intensification reduces the biological diversity of the grasslands and abandonment results in the replacement of the grasslands through the development of coarse herbaceous vegetation, scrub and forest.

Two measures to support the traditional agricultural practices of the area have been established under Regulation 2078/92. A zonal programme provides payments of 1,100 FF per hectare and the *prime a l'herbe* a payment of 300 FF per hectare.

Without these financial incentives the land use of the area would almost certainly develop rapidly away from agriculture and towards forestry, hunting and tourism. Surviving farming activities would be managed at a much greater intensity of management over a much smaller area than is needed to maintain the wildlife interest currently associated with this extensive calcareous grassland plateau.

3. *A species measure - The corncrake in the Scottish Hebrides*

Several of the Environmentally Sensitive Areas (ESA) schemes established as part of the UK's zonal programme (Regulation 2078/92) for the Scottish Islands include specific measures aimed at improving the breeding performance of the corncrake (it is supplemented by a corncrake initiative offering similar payments in corncrake areas outside of the ESA). A description of the ecological requirements has been outlined above. Corncrakes still occur on 19 of the Scottish Islands from Islay in the south to Orkney in the north. The strongholds are Lewis, North and South Uist and Tiree, all areas where farming is based on livestock rearing, involving the growing of hay (and silage) and cereals for winter fodder. The total numbers of pairs is around 500. The corncrake is a globally threatened bird.

The aim of the corncrake payment is to encourage farmers to continue their traditional management but to adjust the timing of their operation to avoid destroying the nests and young of the corncrakes as well as providing vegetation cover for the birds at critical times.

Farmers are paid £180/ha for entering fields into the scheme. In return they agree to:-

- [i] Specify areas of tall ungrazed vegetation adjacent to hay meadows. If no such vegetation exists grants towards the costs of fencing grazing exclusions are available in addition to the basic per hectare payment.
- [ii] Remove all grazing animals from meadows by 1st. June at the latest.
- [iii] Complete all mechanised operations by the 1st May (harrowing and rolling) and complete manure spreading by the 15th May and chemical fertiliser applications by the 1st. June.
- [iv] Cut the crop after 1st August and to do so using a "corncrake friendly" technique, that is, cutting the crop from the centre of the field to the edges rather than in the conventional manner from the edge of the field towards the centre (the latter concentrating and trapping birds in the final section of the crop).

Although it is too early to judge the success of the scheme the population, which had declined for decades at a rate of 3-4% per year increased by 4% between 1993 and 1994 and by 16% between 1994 and 1995.

How policy might develop in the future

From the examples above it is clear that for many of Europe's most valued habitats and the plants and animals associated with these the only realistic short term strategy for addressing their needs is through modifications to the agriculture policy that influences the day to day management decisions of farmers. Regulation 2078/92 is a relatively new and developing

policy instrument which undoubtedly has the potential for making a significant contribution to maintaining and enhancing European biodiversity but to achieve this potential will need greater resources and wider application. For instance the measures outlined above in Extremadura are geographically localised and more areas need to be included to be really effective.

It has often been argued that the CAP has had mainly negative effects on the environment, with the guarantee of high prices above the world market level and export subsidies seen as a stimulus for intensification. But at the same time the CAP and related structural measures have played an important role in maintaining extensive farming systems throughout the EU - the systems within which many of the most highly valued ecological processes operate.

In a current study for DG XI (Goss et al *in prep*) the authors suggest that future generations of 2078/92-type schemes could be even more effective if they operate within an agricultural policy context which is directing agricultural practice in a similar (rather than opposing) direction. A similar theme was the focus of a number of papers presented at a seminar in Brussels in January 1996 (Mitchell 1996 ed.) where it was pointed out that the environmental contributions of their farming activities need to be recognised and appreciated. Many that are valued most from an environmental viewpoint have limited agronomic justification in modern production agriculture and their environmental products have to be paid for. In a broader policy context there are also strong supporting arguments from the social and rural community perspectives for sustaining agriculture for objectives other than purely for production.

Perhaps we should also ask what the prognosis for nature conservation and biodiversity on farmland is if agriculture policy were to evolve without an integral environmental element such as the measures provided by Regulation 2078/92. Beaufoy et al (1994) identify intensification or abandonment as the most likely scenarios for the areas which are currently of highest nature conservation value. Whilst it is difficult to make sweeping generalisations, since many of the ecological processes and relationships on farmland are complex and often poorly understood, there is a strong justification for at least maintaining the *status quo* on farmland of high natural value where the infrastructure and human population still remain to make this possible.

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