La Cañada

Newsletter of the European Forum on Nature Conservation and Pastoralism

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The 6th Forum on Nature Conservation and Pastoralism Luhacovice, Czech Republic 6-10 June 1998

As reported in the last issue, the 6th Forum will be held in Luhacovice, near the Czech/Slovak border, between Saturday 6 June and Wednesday 10 June 1998. Davy McCracken and Kate Partridge had a very successful trip to the area in November and consequently the details of the programme are progressing well. Jaroslav Ungerman of VERONICA (the Czech Association for Nature Conservation) in Brno and the staff at Spolecensky dum (the Conference Centre in Luhacovice) are proving extremely helpful with arrangements on the ground.

The theme for the conference is: *Managing high nature conservation value farmland: policies, processes and practices*. The meeting will focus on the practical lessons to be learned from experiences in both EU and central and eastern European countries.

Session topics

After a field trip to a number of local farms on the Sunday, the remainder of the two and a half days will be taken up by a combination of oral presentations and workshop sessions. The programme has been designed to allow plenty of time for interesting and informative discussions. It is intended that the oral presentations will revolve around sessions focused on questions such as:

- How much do we know and still need to investigate about the detailed ecological relationships between farming practices and wildlife value?
- What particular management practices are required in order to maintain the wildlife value of these farming systems?
- How useful have agri-environment schemes been in delivering and maintaining environmental aims and objectives?
- What should central and eastern European countries be doing to prepare for the future (particularly with regard to entry into the European Union)?

The whole afternoon of the second day will be devoted to discussions within workshops considering:

- What exactly is high nature conservation value farming and how to define it?
- What is the best way to manage areas of high nature farmland (especially in areas of central and eastern Europe where many farmers have now left the land)?
- What is the best way to market produce from high-nature-value farms? or
- What is the best way to expand the European network of interested parties?

The White Carpathians

The Bile Karpaty (White Carpathians) are famous for their flower-rich meadows and these should be quite spectacular at the beginning of June. The hospitality shown to guests in the Czech Republic should also prove to be memorable. Indeed, the meeting is already proving extremely attractive with over 100 people having already requested further information and over 50 offers of papers. Unfortunately, the number of participants and presentations will need to be limited but a full report of the meeting will be included in a future issue of *La Cañada*.

Phil Wilson

Hillside view in the White Carpathians.

INTECOL: VII International Congress of Ecology, Florence 19-26 July 1998

The theme of the Congress is: *New tasks for ecologists after Rio*. The European Forum on Nature Conservation & Pastoralism will be organising a Symposium entitled *Conservation of biodiversity by supporting high-nature-value farming systems*

In the search for environmentally sustainable approaches following the Rio agreements, it is often overlooked that current European policies continue to damage one of the longest-established and previously widespread sustainable land-uses: farming within the local capacity of the land. These farming practices have directly influenced the dominant vegetation patterns of much of Europe for thousands of years, but they are increasingly being replaced because of the industrialisation of agriculture based on imported chemicals and energy. This has environmental and economic costs, including pollution, which are rarely attributed to the agri-industrial activity. The challenge for ecologists is to describe the traditional systems and to work with economists, agronomists and policy developers to identify potential solutions which combine the conservation of biodiversity with socio-economic policies which attract young people to careers in traditionally-based land management. A related challenge is to identify the areas of priority for attention. Many of these are Mediterranean ecosystems where continuity of agriculture and related wildlife assemblages remain over large areas but are subject to rapid loss under current policies.

Further details of the Congress from: Almo Farina, Vice President INTECOL Secretariat, VII International Congress of Ecology, Lunigiana Museum of Natural History, Fortezza della Brunella, 54011 Aulla, Italy; tel. +39 187 400252, fax. +39 187 420727, email: afarina@tamnet.it

Colin Tubbs 1937-1997

A great loss

The Forum and nature conservation in general suffered a great loss with the death of Colin Tubbs, on 17 October. Colin, together with his wife Jenni, played a key role in the development of the Forum. They had stepped into the breach to provide key administrative roles at the time of restructuring of the Forum and, without this work, the Forum would not be in the strengthening position it is today. However, the role for which Colin is more widely recognised is his very clear and wise writing, based on field experience and incisive thinking. Some of his most recent writing, collating a future vision for the Forum, was in press in *La Cañada* 7 at the time of his death. A fuller version appeared in *British Wildlife* 9: 79-85. Our deepest sympathy goes to Jenni, with whom Colin worked as a team. Colin and Jenni were undertaking work together for the Forum until a few days before his death. We are pleased that Jenni has agreed to continue to work with the Forum.

Colin was a remarkable man, with a commitment to conservation through a deep understanding of wildlife and a mission to explain this to others, whether they be those anxious to learn or those with whom he had to argue a case. The latter group generally developed a deep respect for Colin, whoever won the issue! Below, we print an appreciation of Colin's life, kindly provided by Peter Marren.

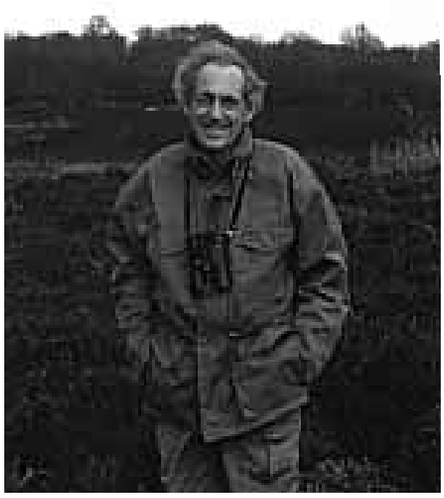
Mike Pienkowski

A battler for wildlife

Colin Tubbs campaigned tirelessly to save wildlife sites in Hampshire and the Isle of Wight in southern England from exploitation. Today the cause to which he devoted his life has become popular, even fashionable. For much of Colin's career, however, he was fighting his corner almost alone. Colin was the Hampshire officer of the Nature Conservancy (later transformed into the Nature Conservancy Council, and, in 1991, into English Nature) from 1960 until 1993. He always resisted pressure to move, including tempting offers of promotion, believing that he would be more effective in his native county. There he became the foremost authority on the New Forest and The Solent, and gradually his ideas on nature conservation began to gain acceptance by local government, the Forestry Commission and many local landowners. At the same time he was instrumental in helping to build a strong voluntary sector in the county. He was one of the first ecologists to combine studies of landscape history and ecology in a synthesis, and understood more clearly than most that high biodiversity is intimately linked to the continuation of low intensity farming methods, such as common grazing.

Colin's performances as an expert witness at public inquiries and parliamentary committees were legendary. He fought well over 160 cases and won nearly all of them, often against the odds, among them the cancellation of the Lyndhurst bypass and the Fawley B power station, and numerous developments in Langstone Harbour. His defence of wildlife sites was always based on the best available scientific evidence, often his own.

Persuading local authorities to take nature conservation seriously was once compared by Colin to water slowly dripping on to a stone. That Hampshire eventually became one of the most enlightened counties was in no small part his doing. He persuaded planners to refuse housing development along the periphery of the New Forest and the government to stop conifer planting there. His dictum was to fight small developments on supposedly protected sites as well as large ones, for, as he put it 'if you don't oppose one increment, how can you oppose the next and avoid death by a thousand cuts?' This philosophy immersed him in unremitting toil, sometimes without much encouragement. In the 1970s and 1980s, Hampshire, one of the most rapidly developing counties in Britain, was a crucible for conservation in practice. Colin chalked up a succession of 'firsts': the first stop-order on a Site of Special Scientific Interest (Baddesley Common), the first Area of Special Protection for birds (Gull Island, in the Solent) and the first successful prosecution of a public body (Southern Water Authority).



Colin Tubbs

An influentual writer

His uncompromising defence of wildlife sites made him enemies, but in environmental circles Colin became something of an icon, and the forerunner of policies which today have gained a very broad measure of public acceptance. Somehow he also found time to write and research, especially on the New Forest. His books include two major works on the Forest. *The New Forest: An Ecological History* (1968) broke new ground as a synthesis of ecological science and land-use history, and *The New Forest* (1986) is the classic account of the area and its wildlife, published in the long-running Collins New Naturalist library. He is also author of *The Buzzard* (1974), the fruit of 20 years' fieldwork in which Colin came to know each individual bird by sight. He was also the authority on the rare honey buzzard, but refrained from publishing anything, lest it should attract nest-watchers and collectors. A major study of *The Solent* completed before his death is in the course of publication. In addition, he published over 100 scientific papers and magazine articles on birds, the management of heathland and coastal harbours for wildlife and the history of pastoral agriculture and commoning. It was a remarkable achievement, possibly a unique one for a person without A levels or a degree, he was, however, elected to the Institute of Biology in 1969 on the basis of his publications.

In recent years Colin became a key player in the European Forum on Nature Conservation and Pastoralism. With his talent for analysis and ability to formulate clear-sighted aims, he was effective in promoting sustainable, high biodiversity farming.

Though a formidable opponent, Colin Tubbs was an affable man who loved to talk and reminisce over a pint of beer or a bottle of wine. He was very widely read. He and Jenni accumulated a sizeable library, and their walls were covered with paintings and prints of their favourite landscapes in the New Forest, and the coastline of Hampshire and Norfolk. They travelled widely in Europe, especially France and Spain, mainly to interesting places for wildlife. By a cruel stroke of fate he was struck down with cancer shortly after taking early retirement, and brimming with plans for the future. He bore his affliction with great courage, and continued to produce a stream of thought-provoking, well written papers and take a full part in conservation events, this time, as he put it, 'on the outside track.' He will be sadly missed by the nature conservation world; the now well-protected wild places of the New Forest and the Isle of Wight are his monument.

Peter Marren

Applying Regulation 2078/92 in the Abruzzo Region of Italy

Augusto De Sanctis

Abandoned cultivated terraces at 1,600m in the Gran Sasso National Park.

The Italian region of Abruzzo is a mainly mountainous area, covering 10,794km^2 of the Central Apennines. Three National Parks, two Regional Parks and several reserves have been designated to provide protection for the main massifs of the region. These inner areas are characterised essentially by mountains and plateaux, which, in fact, comprise two thirds of the total regional area, where the topographical conditions have led to many small mountain villages, some as high as 1,400m.

Today, this mountainous rural landscape has many large expanses of pasture (both natural and semi-natural) which include areas of previously cultivated land, mostly on the flatter areas in the valleys and on the plateaux. Cultivation still occurs but, in the past, covered a more extensive area. This upland 'patchwork' of pasture and cultivation, provides the conditions required by several species of birds protected by EC Directive 409/79, such as the lanner falcon *Falco biarmicus*, ortolan bunting *Emberiza hortulana*, red-backed shrike *Lanius collurio* and chough *Pyrrhocorax pyrrhocorax*.

Declining way of life

The decline of traditional farming in the mountains is primarily connected to:

- the depopulation of the villages caused by emigration to other countries and by movement to urban areas; this has resulted in an ageing rural population, which in turn is leading to the abandonment of ecologically important, but labour intensive, management practices.
- the improvement and modernisation of the irrigation system and of road connections in some areas is encouraging the intensification of agricultural practices.

At the same time the future of pastoralism is also at a critical point. Over the last hundred years the number of sheep has declined from 1,500,000 to 400,000, resulting in the transformation of many former pastures into scrubland. So, from an ecological perspective, the priority for Abruzzo is how to manage these rural changes in a way that will maintain the high biodiversity which is linked to the traditional mosaic landscape.

Applying the Regulation

Regulation 2078/92 was primarily designed to reduce production whilst at the same time produce beneficial effects for the environment (the payments are essentially compensation payments for reduced production). But in this sense, in the Abruzzo Region, Regulation 2078/92 could only be applied in the coastal plain and a few other inland areas, where there is more intensive agriculture and where production is high. But at the same time the Regulation aims to maintain, protect and improve the regional landscape, principally that which is of importance for wildlife. On this basis it should be applied to the entire regional area and in particular the 521,053ha of agricultural land. Unfortunately, from 1992, the first year of the 2078/92 scheme, only 1,158ha (0.2% of the available area) entered into the regional program and Abruzzo ranks last of all the Italian regions. Why?

There are two main problems. One concerns the structure of the farms, while the other concerns the ignorance of the Regional Government.

Firstly, the Programme of Applications provides a number of obligations that each farmer has to comply with. The most fundamental is possession of the land. Unfortunately, in inner areas the properties are heavily fragmented and/or without any formal security of tenure. So in many cases the real occupier of the land could not be confirmed by the administration (land office), preventing the farmer from entering into the scheme. Moreover, each farmer has to adopt a plan for the farm, signed by an advisor, and for some of the measures, a record of operations has to be maintained. In these cases farmers can obtain assistance from advisors from the farmers' union, but many of these advisors consider that assisting with 2078/92 plans is more difficult (it is more work!) than helping the farmers to obtain other kinds of contributions, such as those linked to production or what they consider to be 'agricultural' improvements.

This problem might be resolved through the following actions:

- harmonisation of the regional forest, agronomic and environmental laws, both the regional and the national ones, within the spirit of the EC Regulation;
- making the scheme much more flexible so that objectives can be achieved with less stringent obligations on the farmer;
- the Regulation should provide financial support for the provision of trained advisors in each region, proportional to the size of the region and the area included in the schemes. This action could be included in the Article 6 of Regulation 2078/92 linked with the educational programs.

Regional Application Programme

The second category of problems is linked to the planning capacity (or incapacity) of the Regional Government. The first Regional Application Programme (1992) of Regulation 2078/92 did not relate to reality on the ground – either in landscapes or ecological terms. Only three homogeneous areas were identified, with only one subzone. No type of traditional landscape was identified, probably because of the lack of local knowledge by the authors of the regional programmes. In the introductory chapter of this programme the abandonment of the inner areas was identified as a major problem; nonetheless within these areas the 'set-aside' measures were included which potentially exacerbated the situation. There are other similar contradictions between the intention of the Regulation and the actions on the ground. Ironically, for example the Regional Application Programme's 'care of the abandoned forested areas' measure supported the 'cleaning of the undergrowth' of 10,000ha of forest.

So, paradoxically, it might be regarded as a good thing for the natural value of Abruzzo that 2078/92 schemes failed to be applied to any extent in the early years of the programme.

Abruzzo – the culture of transhumance

Apennine pastoralism dates to the Bronze Age and after a decline between 1300BC and 1000BC sheep breeding regains importance firstly with the Italic populations and later with the Romans. The importance of sheep is emphasised by the fact that the root of the latin word '*pecunia*' (which means coin) is found in the word '*pecua*' which means sheep.
In the late Middle Ages and during the Renaissance, Apennine pastoralism gains strength, especially because of the wool trade. The 15th century saw the development of the Sheep 'Customs' House in Foggia (Puglia) which controlled transhumance. During this period much of the economy of the Abruzzo Region was based on pastoralism with about 3 million sheep and 30,000 shepherds (in a population of 300,000 people). Half of the flocks were involved in transhumance from Abruzzo to Puglia Region in the autumn (returning in the spring) and a great deal of evidence of this rural culture survives – the villages of dry-stone shelters ('Tholos') on the summer pastures; the way-station churches along the migration routes; and the Abruzzo sheep dog. In Roman times the migration routes were called '*calles*', later these grassy trails were called '*tractoria*' and finally the name still used today, '*tratturi*' ('drove road' in English, '*La Cañada*' in Spanish). As with other European transhumance cultures the *tratturi* were protected from cultivation by a law, which also established their minimum width (111m for the main ones). In 1959 the last official map of the *tratturi* showed a network of over 3,100km (over 21,000ha).
Apart from a small increase in the 1980s sheep numbers continue to decline; and the prediction is that this will continue. Both sheep and cattle numbers are currently the lowest ever. In the last 20 years cattle numbers have halved and there are now one sixth the number of sheep present in 1500.
The ecological implications for this pastoral landscape are profound – in the short term there are potential winners and losers. For instance, the loss of certain endangered populations such as alpine chough *Pyrrhocorax graculus* and rock partridge *Alectoris graeca* is possible, whilst for species such as ring ouzel *Turdus torquatus*, dunnock *Prunnella modularis*, white-backed woodpecker, *Drendrocopos leucotos* and brown bear *Ursus arctos* there may be benefits. What is most important is the ecological implications in the longer term: whether there will be some stable management system which will provide the landscape mosaic, and the ecological conditions, in which the biological processes that we value can operate. Whatever the case, large herbivores are likely to be an essential part of the landscape.

Augusto De Sanctis

Sheep grazing in typical primary pasture, guarded by an Abruzzian sheep dog.

By the end of 1997 the new version of the Regional Application Programme was presented. Despite the failure of the original one the new programme was practically the same. The total absence of any provision for regional personnel (800 are currently employed) to specialise on the ecological aspects of the programme missed a great opportunity to influence and manage the potential changes to the Abruzzo environment.

In fact Regulation 2078/92 could potentially make an important contribution towards the conservation of the ecologically important traditional agricultural systems in the Mediterranean regions. However, because of the great complexity of these Mediterranean ecosystems it is necessary for the Regional Governments involved to have a profound knowledge of both the local farming systems and of their associated ecological processes. Where this knowledge is lacking the European Commission should be aware that there is little prospect of real environmental benefits through Regulation 2078/92. In fact, as pointed out above, there could be a real danger of the Regulation inadvertently having counter-productive effects.

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Different approaches to zonal programmes in western Scotland and south-eastern Portugal

I was fortunate enough to take part in a visit by crofters, farmers, advisors and rural development workers from the Crofting counties of Scotland to the Alentejo region of Portugal. Arranged for the Forum by Eric Bignal and Peter Eden, the trip was part-funded under the Travel Grant Aid Programme of DGXI of the European Commission.

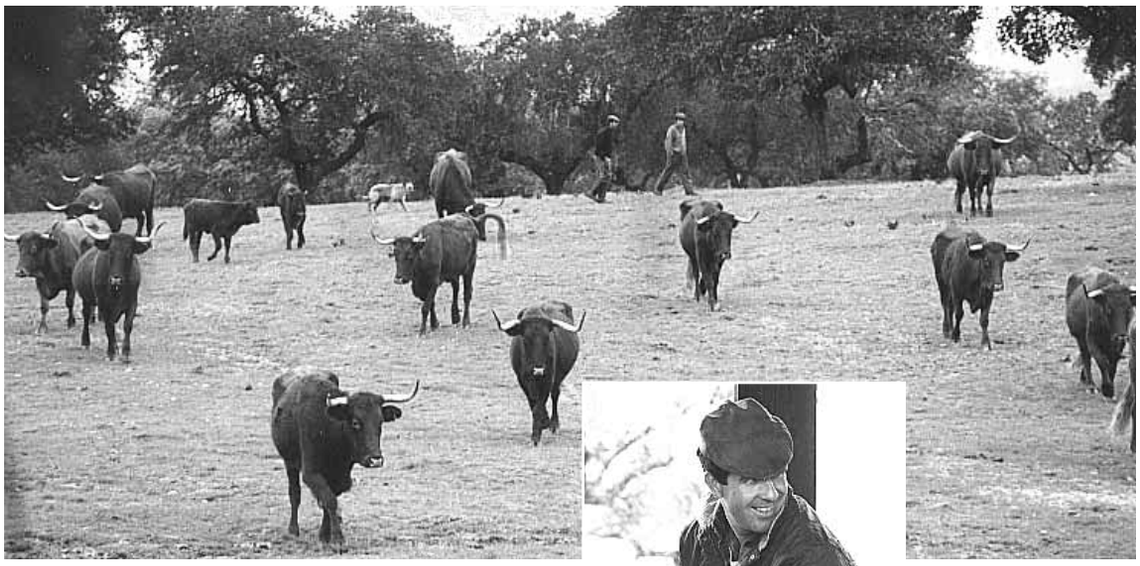
The trip took in a number of localities, illustrating many aspects of the interaction of low-intensity agriculture and conservation. The successful link made between 'environmentally-friendly' agriculture and premium products – hams, high quality olive oil and cheeses, for example – was particularly impressive.

Interesting also was the contrast between the apparent success of the 'bottom-up' and 'top-down' approaches to rural development. The weaknesses of the latter were illustrated only too well by a modern but under-utilised honey processing plant built by the state Forestry Institute on its Contenda Estate. In marked contrast was the apparent success of the Castro Verde Zonal Plan – the first in Portugal to be set up under the 'Agri-environment' Regulation (2078/92). The Plan, which covers 64,000ha, is geared to protecting one of the largest populations of steppe birds in Portugal. These are intimately linked to the 'pseudo-steppe' habitat created by centuries of low-intensity cereal growing.

A bottom-up approach was very much in evidence here with rules initially set by a committee composed of the Ministries of Agriculture and Environment and the Farmers' Association of the Campo Branco. The Plan was implemented locally by an employee of the Farmers' Association. Grass and cereal harvest dates are determined on a year-by-year basis on a local level based on the type of year from the point of view of both crops and steppe birds.

Argyll Islands ESA

The ins and outs of the Castro Verde Zonal Plan were of special interest to me. Much of my work is concerned with preparing applications for farmers and crofters in the Argyll Islands ESA and although they stem from exactly the same piece of legislation, the contrasts between the two initiatives (and with the Machairs of the Uists, Benbecula, Barra and Vatersay ESA with which I have also had some contact) were very striking.



G Jones

Herding the local Alentejana breed of cattle in holm oak montado at Moura, Alentejo.
Inset: Tagging black merino sheep at the Contenda Estate, Barrancos. This rare breed is in demand again both for breeding purposes and for its wool and meat.

To give some background – the Machairs ESA is limited to the flat area of calcareous sand and sand-covered peat (machair) along the western edge of the southernmost Outer Hebrides.

The Argyll Islands ESA, in contrast, covers over 20 islands (17 permanently inhabited) in the Inner Hebrides. It contains a wide variety of habitats, agricultural systems and sizes of farming unit. Both these ESAs are run by the Scottish Office Agriculture, Environment and Fisheries Department. Rule changes and all other decisions are made by them, having consulted other departments where appropriate. Farmers play no part in the process. At the biennial review of the rules, comment is invited from agricultural and conservation advisors only.

After the shock of seeing local farmers intimately involved in the running of the scheme, the next surprise was the size of the guidance notes for farmers. The Castro Verde Plan is nothing if not straightforward. All the rules would fit on three sides of A4, compared to about 20 in the case of the Scottish ESAs!

In Castro Verde the farmer deals directly with the local support officer. The requirements for entry into the Scottish ESAs include preparing descriptive and management maps of the unit and a management plan which must conform to detailed standards. Very few farmers (<5%) have tried, let alone succeeded, in submitting a plan without professional help.

Part of the reason for this difference lies in the simplicity of the Castro Verde rules. The whole farm is covered and all the prescriptions are compulsory. There is no need to select between options, or to choose which area of habitat will form the 'significant proportion' to be managed, as is the case in Scotland. The differences between the three programmes do, of course, reflect to some extent the variation in heterogeneity between the various areas.

Systems-based rules

The extent to which the zonal programmes are systems-based varies considerably if these three areas are in any way representative. This is the real reason for the simplicity of the Castro Verde scheme – farmers are essentially being paid to farm in a way familiar to them from their forefathers' days. The pattern of rotation, the stocking rates, the cutting dates – almost all the rules – are just variations on what has always been done.

The Machairs ESA is some way towards this ideal. Here the major elements are traditional arable and hay cropping patterns. But here we see the first indications of the approach which is dominant in the Argyll Islands. Wetland is not to be protected just by being unattractive to stock as a corner of an 'improved' field – it has to be 'positively managed'. Stocking rates and grazing dates have to be specified and delivered.

Herb-rich pasture and machair also need particular attention. In many cases this will involve fencing off a small area, which is not grazed in summer, while the same number of stock graze the adjoining unfenced area.

Woodland, often dying because regeneration is suppressed by sheep and deer grazing, has to be fenced off, often for the first time ever (at least in one area where traditional management was often lacking). Meanwhile the rough grazings, which form the bulk of many of the islands, are covered only by voluntary prescriptions unattractive to the farmer. Bracken *Pteridium aquilinum* is often encroaching onto grasslands, and purple moor-grass *Molinia caerulea* dominates many of the wetter areas. Both were formerly kept in check by the cattle which were the *raison d'être* of the fields of oats and hay.

According to the Argyll Islands' Exploratory Booklet, 'farming and crofting practices have helped create distinctive landscapes and have maintained wildlife habitats and historic features... The valued wildlife of these islands depends upon traditional management of the... natural habitat.'

But for all the praise lavished on 'traditional husbandry' it would seem that no practical system can be devised that will deliver once again the perceived benefits of the past. Perhaps this situation indicates a lack of knowledge and understanding of the beneficial effects on the environment of different low-intensity agricultural systems giving an overemphasis in detailed management prescriptions for particular species and not enough emphasis on the 'system'.

Do we even know enough about the types of system which did in fact operate in the past or are we wedded to a mythical and simplistic 'tradition'? Is it, in fact, more than likely that some of the present-day habitats that we value are the transient results of a decline of former practices and systems?

The future of environmentally-friendly farming in low-intensity systems is not bound up in nature reserve-like management of individual patches within the whole unit. Conservation bodies really need to know what end-product they want to see in the farmed countryside, and to have respect for the farmers' ability to provide the technical expertise to produce this. In this respect are we confident that we know what the ramifications of changes to agricultural support would be ?

The visit to Portugal perhaps raised many more questions that it answered, but illustrated that Regulation 2078/92 does potentially have the flexibility to provide schemes attractive to farmers in a wide variety of situations. Success is dependent on the way the schemes are administered.

G Jones

The Avon and Test Valleys ESAs

The Rivers Avon and Test drain the low chalk plateau of central southern England. Before human intervention, they flowed in braided channels through wide floodplains dominated by carr and reed in which the water table was normally at or near the surface. Both the rivers and their floodplains have ecological and land-use peculiarities which give rise to great biological richness. The chalk is a soft, highly permeable base-rich rock. Rainfall on the chalk permeates rapidly and accumulates in vast underground aquifers: there is little surface run-off. The chalk streams are thus mainly spring-fed by base-rich water, and their flows vary little from season to season. An exception is the lower reach of the Avon, which in addition is fed by run-off from tributaries resulting in periodic winter flooding of the floodplain.

Water meadows

The valleys were mostly wet meadow in late medieval times. More sophisticated modifications began with the diversion and training of water courses to provide waterheads for mills and then, from the early 17th to the early 19th centuries, the construction of floated water meadows. These were permanent irrigation systems in which the former pastures were formed into parallel ridges. Base-rich water was fed into carriers along the crests of the ridges and permitted to overflow down their sides into drains which carried the water off the meadow. The purpose was to irrigate with water rich in suspended chalky alluvium. The ridge-and-furrow layout served to maintain a steady flow through the meadow. The constant and relatively high temperature of the water, derived from the deep aquifers, ensured that the meadows remained frost-free. The systems were usually complex, with intricate patterns of interdependent meadows.

In the 18th and 19th centuries the water meadows were a vital element in chalkland farming. The exact sequence varied, but normally they were watered in winter after which they provided early spring sheep grazing; were watered again to give several hay crops; then grazed until winter watering. The meadows were so productive that when used in conjunction with extensive sheep grazing of unimproved, dry chalk grassland they permitted farmers to cultivate more arable than would otherwise have been possible. The water meadow system survived in the chalk stream valleys into the 1930s. Their complexity and inconvenience, rather than their economics, killed them off in favour of inorganic fertilisers.

ESA objectives

In 1988 the Test and Avon Valleys became Environmentally Sensitive Areas. By that time the valley floors were mostly improved or part-improved pasture, with relict patches of botanically species-rich grassland and patterns of minor watercourses and ditches. There had, however, been much deep drainage, and water levels were generally low in spring and summer. The Avon Valley held nationally important, though declining, populations of breeding waders and other wetland birds. Many thousands of waterfowl occurred on winter floodwaters.

The ESAs could, with equal logic, have sought to restore the lost water meadows and their somewhat species-poor but highly distinctive flora, the species-rich fen which preceded them, or the (unknown) content of the pasture which they left. There was no clear rationale to the ESA's objectives. The rationale to halting the decline in breeding bird populations was clearer, though there is no evidence that these were ever large in the Test Valley.

In the event, the relevant objectives of the Test Valley ESA were to maintain and enhance landscape quality by retention of existing grassland and by increasing grassland area; to maintain and enhance the wildlife conservation value of grassland; to maintain and enhance landscape quality through management of characteristic landscape elements; and to maintain and enhance archaeological and historic features; all of which are unsupported by a clear rationale. The ESA objectives for the Avon Valley are similar, save that they also aim to enhance the wildlife conservation value of wet grassland without detriment to the landscape by maintaining higher levels in ditches and watercourses. For unexplained reasons there is thought to be a potential conflict between increasing the wetness of the valley and maintaining the character of its landscape – which begs the question of what landscape is aimed for and why.

Low take-up by farmers

The Test Valley ESA covered 2,631ha in 1993 and was extended to 4,777ha in 1993 by including the valleys of three tributaries. The Avon Valley ESA extends to 5,200ha. Farmers receive payments for entering into 10-year management agreements. The results of monitoring the effectiveness of the ESAs were published in 1996. They are somewhat short on clarity, but it seems that in the Test Valley 49% of 1,624ha of improved grassland and 16% of 860ha of unimproved grassland were entered into the scheme. Agreements provided for the withdrawal of fertilisers or limits to their use, and for the appropriate management of ditches and other wetland habitats. In the Avon Valley, 5% of 2,630ha of what is described as 'wet grassland', evidently relatively unimproved, and 25% of 3,257ha of

Bob Gibbons

A classic chalk stream landscape in the Test Valley at Chilbolton Common, Hampshire, southern England.

improved grassland, were entered. In both valleys, agreements encompassed the reversion of small amounts of arable to grassland. The take-up of agreements was thus relatively small.

The results of botanical monitoring in the Test Valley showed that the 'quality' (not clearly defined) of the grasslands remained unchanged. Where inorganic fertilisers had been withdrawn, it was suggested (reasonably) that this was probably the result of the high nutrient status on fertilised sites and the absence of a locally available seed-bank. No other significant changes in the valley were detected, though whether this was the result of the ESA agreements or not could not be determined. In the Avon Valley, there was, similarly, no change in the vegetation (or landscape), but a 29% decline in the numbers of breeding waders in the areas under agreements which were sampled. Winter floods and the associated concentrations of waterfowl, were unaffected.

It is hard to avoid the conclusion that these ESA schemes have made little difference to the biological condition of the two valleys. This is mainly because payments are too low to encourage farmers to reduce the intensity of their farming. It is also the case that in considering whether to enter into the scheme, individuals are influenced not only by payment levels but also by the necessity to change or abandon farming systems which they have progressively refined over long periods of time. This is particularly so with those who have built up quality dairy herds. In the Test valley these problems are compounded by other factors. First, the land is mostly within large estates which derive incomes from the world-famous fly fishery on the river, which distracts from any interest in what are seen as a paltry income from the ESA. Second, most of the unimproved species-rich fen grassland in the valley is within a number of commons, which are protected against change by their status as Sites of Special Scientific Interest or by ownership by the National Trust.

From a nature conservation standpoint, the greatest rewards from the ESAs might derive from raising the water levels in the floodplains not only so that the ditch levels would increase but that there would be 'flashes' of water and abundant muddy patches on the surface during the spring, thus providing breeding habitat for waders, and, critically, feeding sites for chicks, besides enriching flood plain plant communities. How 'traditional' to the valleys these were and over what time span, is arguable, but they would be laudable objectives. Yet this, the most critical of objectives, remains, effectively, beyond the scope of the ESA Schemes.

Colin R Tubbs

WWF reaction to Agenda 2000

On 16 July 1997, the European Commission presented the Agenda 2000 document on the future reform of the Common Agricultural Policy (CAP) and the future of the Structural and Cohesion Funds (see *La Cañada 7*).

This summarises WWF's reaction and its key recommendations:

- Compensatory direct payments must be made dependent upon farmers meeting basic environmental standards, and must be phased out over time. The European Commission must require all Member States to define environmental baseline standards. All direct payments to farmers must be dependent upon farmers meeting these standards. The European Commission should develop a timetable for them to be eventually phased out.
- Greater resources must be allocated to agri-environmental and sustainable rural development programmes: 25% of the CAP Guarantee budget must be shifted to agri-environmental measures and 50% to sustainable rural development programmes by 2006.
- Countries of Central and Eastern Europe must make the environment central to their agriculture policy: the European Commission must earmark 25% of the proposed CAP budget for these countries to agri-environmental programmes and provide 100% funding for pre-accession pilot projects.

General comments

WWF is alarmed that the Commission's proposals continue to leave the environment at the periphery of the CAP. The package does not go far enough to shift policy from production-related support towards environmental and sustainable rural development measures, offering little hope for Europe's declining wildlife and rural areas. The lack of concrete proposals for better environmental integration into the agricultural policies of Central and Eastern Europe is a major omission.

Agenda 2000 does, however, outline a wider range of objectives for the CAP, including the need to improve the production of quality food, the integration of environmental concerns and the need to promote rural development. These WWF supports. However, Agenda 2000 does not back these objectives with detailed proposals and financial commitments. 85% (50bn ECU) of the total agricultural expenditure will still be spent on market mechanisms in 2006 according to the Commission forecasts. Reductions in price support are welcome. However, they will be compensated for by new compensatory direct payments to farmers. WWF is shocked that the Commission has not proposed to phase out these payments over time.

The farming sector should realise that the support systems proposed in Agenda 2000 will be challenged by trading partners and that there is likely to be less opposition to a move by the EU to real environmental and sustainable rural development payments.

WWF is disappointed that the Commission went no further than to propose 'to enable' Member States to make direct compensatory payments conditional on respecting environmental provisions.

Specific comments

1 The EC forecasts that the system of direct compensatory payments proposed in Agenda 2000 to cushion the decreases in price support will cost an additional 7.7bn ECU by 2006. WWF believe that the proposed system of compensatory direct payments is far too generous and cannot be justified from a taxpayer's perspective.

2 2.8bn ECU a year is ear-marked for accompanying measures (agri-environment, afforestation and early retirement). Though this is a welcome increase to the existing budget for such measures, WWF does not believe that it will be sufficient to address environmental concerns by 2006 and recommends that levels of co-funding offered to Member States for agri-environment programmes under regulation 2078/92 should be increased (in stages). Better environmental information, training, education and extension programmes must be developed by Member States to ensure that programmes have clear environmental objectives, that they are adopted by farmers and that they are achievable.

3 The shift of rural development measures and the Less Favoured Area (LFA) payments from the Guidance to the Guarantee Section of EAGGF is a positive move. It will in theory allow an implicit transfer of funds from the Common Market Organisations to these measures. Market support measures in the form of unconditional compensatory direct payments are certain to be challenged during the next World Trade Organisation negotiations. Farmers should be under no illusion that such support can last. In WWF's opinion more financial resources should be transferred explicitly from price support and compensatory direct payments to environmental (where benefits can be clearly demonstrated) and sustainable rural

development measures.

4 In the crop sector, the further shift from price support to direct payments could lead to some environmental benefits in the form of decreased input use. However, the proposals fail to integrate environmental objectives. Member States will be allowed to make direct payments for arable crops and set-aside conditional on respecting environmental provisions, but this is not obligatory and such provisions, which already exist in the beef and sheep sector, have not been widely adopted.

5 The exclusion of silage cereals (mainly silage maize) from the cereals regime is welcome as it indicates the removal of explicit support from an environmentally damaging practice.

6 In the livestock sector a reduction in the intervention price for beef is welcome, but WWF is disappointed to see this compensated by direct income payments per head of cattle. WWF suggests that there is more likelihood of achieving environmental objectives if headage payments are replaced by area-based payments. With an area-based system the development of more demanding tiered environmental schemes (above the basic good environmental practice required to receive area payments) is more feasible.

7 The European Commission's proposed gradual decrease in price support within the dairy sector is far too conservative. CAP price support to lowland dairying encourages intensive production and WWF favours an area-based payment system built upon the pursuit of environmental goals.

8 WWF welcomes the European Commission's intention to give agri-environmental instruments a prominent role to support the sustainable development of rural areas. However, we fear that there is insufficient budgetary support to carry this intention to fruition.

9 The proposal to revise the LFA policy could be of great value, especially if stronger environmental objectives were introduced to the LFA scheme and if payments were used to maintain and enhance extensive farming systems of high nature conservation value. WWF strongly urges the Commission to progress the tentative proposals to transform the LFA support scheme into an integrated programme to maintain and promote low input farming systems. A new system based on the LFA could be targeted at Natura 2000 sites and agricultural landscapes of high nature conservation value.

10 WWF is concerned that Agenda 2000 ignores the important role Regulation 2078/92 must play for nature conservation in Europe. Broad based agri-environmental schemes should be available to all farmers to maintain or improve the environmental value of their land. More specific and targeted schemes should be used for more demanding practices and farm-based nature conservation.

11 WWF supports the development of a rural policy in line with the general concepts discussed at the Cork conference in November 1996. However, despite encouraging words in the Cork Declaration, Agenda 2000 puts very few resources and concrete ideas behind such a policy. It is also disappointing that Agenda 2000 fails to mention that a European rural development policy must be ecologically sound, economically viable and socially equitable.

12 Rural development measures outside the new Objective 1 and 2 areas will be entitled to co-financing from the EAGGF Guarantee Section. WWF welcomes the shift of these funds from the Guidance to Guarantee Section as it should make the transfer of monies from the market sector to rural development programmes easier. However, the intention to do so is not spelled out in Agenda 2000. Only 4% of the total anticipated budget for the current 15 Member States by 2006 is allocated to new rural development accompanying measures (ie. only 2.1bn ECU). A greater share of the budget must be redirected to rural development programmes. The European Commission should set a clear target and aim at shifting 50% of the CAP Guarantee budget to sustainable rural development programmes by 2006.

13 The EC should focus further work to ensure that a new rural development policy is ecologically sound. The new rural development accompanying measures must not degrade our natural resource base, they should aim to protect and enhance nature and the environment as well as conserve Europe's cultural landscape diversity.

14 WWF is disappointed to see that 2.5bn ECU has been forecast for specific rural development accompanying measures by 2006 for the new Member States without a single reference to the environment and nature protection. We fear that these funds will be used in a way that degrades the natural environment; that improvements to rural infrastructure could damage nature, biological diversity and the environment at large. CEE countries should be encouraged to develop decoupled support mechanisms that pursue environmental and sustainable rural development goals. These countries should receive pre-accession funding to develop agri-environmental pilot programmes and to help capacity building in the field of ecologically sound agriculture.

The full text of the WWF position on Agenda 2000 is available from: WWF, European Policy Office, 36 Avenue de Tervuren B-12, B-1040 Brussels, Belgium. Tel: 0032 2 7438800; fax 7438819.

Announcements and Noticeboard

Report on the EU Expert Seminar – Agricultural and Natura 2000

This seminar was held in Apeldoorn, The Netherlands, on 19/20 June 1997, during the Dutch EU presidency, for the Members of the EU Habitat Committee and the EU STAR Committee. It was organised by the Dutch Ministry of Agriculture, Nature Management and Fisheries, with support of the EC, DG XI/D/2 and in collaboration with AIDEnvironment, Amsterdam. The report is in three volumes.

Volume I is the background document giving an overview of the implementation of Natura 2000, Regulation 2078/92 and the LIFE regulation, especially regarding the interface between agriculture and nature conservation.

Volume II is the report of the meeting, giving an overview of the discussions and the ideas presented and Volume III contains the presentations of the speakers from EU countries, the European Commission and from central and eastern European (CEE) countries.

The meeting concluded that the process of loss of biodiversity on farmland is continuing not only through agricultural intensification but also from abandonment, and that farmland of high natural value is still threatened. The seminar was timely in that it gave an opportunity for CEE countries to voice their opinions at a critical time in policy development.

Volumes I and II will also appear in French and German.

Copies are available from the secretariat of the Division of International Affairs of the Dutch Ministry of Agriculture, Nature Management and Fisheries (Tel: +31 70 3785007, fax +31 70 3786146).

Agenda 2000 and Prospects for the Environment

On 3 February the Forum, with the support of WWF, are holding a seminar on the above subject.

The aims of the seminar are to review what is proposed in Agenda 2000 and assess what the benefits are likely to be for the environment and, more specifically, for nature. Using examples, the seminar will describe why certain farming systems are important for nature. The seminar will examine possible changes in policy instruments which could give greater support to environmentally-friendly farming systems within the context of Agenda 2000. It is hoped that there will be a good attendance of EC officials.

Agenda items include: The Ecological Context of European Agriculture: an EFNCP View; Agenda 2000: Prognosis for the Environment and Nature; The Importance of Livestock Farming for Nature – The Ecology of Pastoralism; Policy Options for Livestock System Area Payments; The Environmental and Nature Value of Olive Production; Policy Options for Olive Cultivation; Sustainable Rural Development and a Revised Less Favoured Area Policy.

A report will be published outlining the presentations and the discussions. There will also be an article on the seminar in the next issue of *La Cañada*.

European Community Biodiversity Strategy

The 1993 Convention on Biological Diversity (CBD) placed an obligation on each signatory to prepare a Biodiversity Strategy (Article 1), and within this framework, elaborate on the required action plans (Article 6). The European Commission (DG11) has now prepared a Biodiversity Strategy in consultation with Member States and a range of non-government organisations (NGOs), including the European Forum on Nature Conservation and Pastoralism. This document will be put before ministers early in 1998, and if agreed, will form a basis for the immediate preparation of Biodiversity Action Plans throughout the Commission.

The Strategy

The Strategy touches on topics as wide-ranging as genetically-modified organisms and tropical rainforests. Its main thrust, however, is to provide a coherent framework for the conservation of biodiversity throughout the Commission's activities. This will be attempted by integrating conservation targets into a range of sectoral and cross-sectoral policy areas. To achieve this level of integration the Strategy sets out a number of 'themes', each with aims derived from the CBD. These thematic aims are then addressed by specific 'objectives' within each policy area or 'sector'.

Themes
1 Conservation of biodiversity
2 Sustainable use of biodiversity
3 Sharing benefits of the use of genetic resources
4 Research, monitoring and exchange of information
5 Education training and awareness

Sectors (policy areas)
1 Conservation of natural resources
2 Agriculture and forest policies
3 Fisheries
4 Regional policies and spatial planning
5 Transport and energy
6 Tourism
7 International co-operation

For example, one of the aims of the 'Sustainable use of biodiversity' (Theme 2), is to support the social and economic viability of systems that underpin biodiversity. In the case of agriculture (Sector 2), the corresponding 'objective' is to continue shifting agricultural support away from intensive farming practices towards those that enhance biodiversity. In the case of 'Regional policies and spatial planning' (Sector 4), however, the relevant objectives will relate to the design of zonal programmes and the targeting of financial instruments such as the Structural Funds, the Cohesion Funds and the efforts of the European Investment Bank.

The level of inter-linkage between thematic aims and policy area objectives across the sectors has the potential of taking conservation policy to the heart of mainstream land-use and economic planning. It needs to be remembered, however, that the strategy is simply a framework that will need to be elaborated by preparing, implementing and refining the relevant action plans.

The Action Plans

The role of the Action Plans (CBD, Article 6) will be to set out how the policy area objectives in the strategy are to be achieved, and over what time-scale. The Action Plans will, therefore, form the core of a quality assurance process that will make it possible to monitor and review the impact of the strategy. This process will be overseen from a number of 'focal points' that will be established within the Commission. It is perhaps through one or more of these focal points that the NGOs may be able to secure a continuing role in the development of the strategy. This would flow very naturally from the draft's positive references to the value of NGOs.

Role of extensive farming systems

The Strategy establishes the link between high biodiversity and extensive systems of land-management, and highlights the need to support these systems, together with their indigenous communities, related technologies and domesticated species. It also endeavours to protect the biologically-rich landscapes of central and eastern Europe as potential new Member States run up to accession.

These, and other concerns throughout the Strategy, seem to put extensive land-use systems close to the centre of the Commission's thrust to meet its obligations under the 1993 Convention on Biological Diversity. This is a position that the Forum has encouraged, and is one which the Forum is able and eager to support.

Dr Colin Hindmarch

Declining UK butterflies should benefit from agri-environment schemes

Over three-quarters of the UK's 59 resident butterfly species breed in grassland habitats over all or part of their range. Their populations are often extremely sensitive to grassland management, responding rapidly to alterations in grazing regimes, and can reflect population changes that are occurring in other invertebrates (e.g. Thomas 1991). Butterflies can therefore be useful indicators of the impact on grassland habitats brought about by agri-environment schemes.

Of the 44 butterflies that breed in lowland grassland, two are extinct, eight are highly threatened, and half are in steep decline. Butterfly Conservation, a wildlife charity concerned with the conservation of butterflies and moths, has drawn up detailed Action Plans for these key species which identify three major causes of their decline:

1 continuing loss of traditionally managed, low input grasslands;
2 unsuitable management of the remaining grasslands; and
3 fragmentation and isolation of these remaining grasslands.

Tackling these deep-rooted problems represents a major challenge to conservationists and the plans identify specific actions that are needed on a range of issues. However, all of the Action Plans recognise that agri-environment schemes such as Environmentally Sensitive Areas (ESA's) can play a fundamental role in tackling these three major problems.

Potential for ESAs to affect key species

A significant proportion of colonies of threatened grassland butterflies now occurs within ESA boundaries, which covers approximately 10% of the farmed land in the UK (Table 1), and have been targeted at areas of high environmental quality. The remaining colonies breed in habitats outside the ESA, many covered by a number of other schemes, all of which are part-funded under the EC Agri-environment Regulation (2078/92). The survival of these butterflies will therefore depend heavily on the take-up of such schemes and their subsequent impact on habitat management.

Table 1 Some threatened grassland butterflies (including the reintroduced large blue) in the UK and their coverage by ESAs.

species	grassland habitat(s)	turf height required (cm)	management required	% of colonies within ESA (approx.)
adonis blue *Lysandra bellargus*	chalk	1-3	heavy grazing	50
large blue *Maculinea arion*	coastal and calcareous	1-4	heavy grazing	60
marsh fritillary *Eurodryas aurinia*	damp and calcareous	8-20	light/moderate grazing (cattle or ponies)	30
heath fritillary *Mellicta athalia*	moorland edge (on Exmoor only)	5-15	light/moderate grazing	50

For grassland butterflies, a key factor determining habitat suitability is turf height, which in turn depends on grazing levels and land productivity.

A number of threatened fritillary butterflies (*Boloria* species) also breed in traditionally-managed grassland within ESAs that have a good cover of bracken *Pteridium aquilinum*, often in bracken/grass mosaics that are maintained by low-intensity grazing by cattle or ponies. On marginal hill land and lower slopes where the soils are only mildly acidic (pH 5-6), such habitats can contain an abundance of the larval food-plants e.g. dog violet *Viola riviniana*, as well as other plants more typical of a woodland flora. These butterflies were formerly widespread in coppiced woodland, but as this traditional practice has declined they have become increasingly confined to non-woodland habitats.

Marsh fritillary

A study was recently carried out on the impact of ESAs and other agri-environment schemes on the marsh fritillary in England (Bourn & Warren 1996). This species is threatened throughout Europe and is protected under the Bern Convention and the EC Habitats and Species Directive. In Britain, the marsh fritillary's range has declined by over 60% (Warren 1994), and a large proportion of its British population is now within ESAs.

The marsh fritillary breeds in two distinct types of habitat: damp, neutral or acid grassland, and dry calcareous grassland, but in both habitats the main food-plant is devil's-bit scabious *Succisa pratensis*. The butterfly lays its eggs in clusters on large plants, typically those growing where turf height is 8-20 cm. The species is therefore very sensitive to high grazing levels and most colonies occur where there is light, extensive cattle grazing, or where grazing has recently been abandoned. Few sites are grazed by sheep, probably because these animals graze the food-plant preferentially making it unsuitable for egg-laying.

The study found that several important sites for the butterfly had been entered into agreements, but that the impact on individual populations was variable. On some sites, the schemes had maintained populations and habitats extremely well, while on others, the quality of the habitat and the population size had declined considerably.

The most common problem arose through the introduction of heavy 'restoration' grazing, considered necessary by some scheme advisors to control scrub and coarse grasses when restoring under-grazed or abandoned sites. While this may bring about the most rapid benefits for rare plants, the resulting uniformly-short sward can be very detrimental for butterflies like the marsh fritillary, and is likely to be harmful to other invertebrates which need longer swards or structurally diverse grasslands.

Martin Warren

Suitable conditions for the marsh fritillary can be created through light, extensive grazing by native breeds of cattle.

Another problem was that the stocking rates required to maintain a suitable sward structure varied considerably from site to site. For example, a stocking rate that may be highly suitable on sheltered sites with good grass growth, can be far too high on exposed or very wet sites. The prescribed stocking rates of some schemes may sometimes be too inflexible to take account of this.

A third problem was that selective grazing was found to be occurring on a few sites where cattle had grazed herb-rich parts of a field very heavily, thereby eliminating butterfly food-plants, while coarser herb-poor vegetation was untouched. This problem seems due mainly to the use of modern breeds of cattle which are more selective and are reluctant to eat coarse vegetation.

Grassland butterflies in other countries

Research in the rest of Europe and elsewhere is revealing similar patterns of dramatic losses of butterflies linked to both the intensification of grassland management, often brought about by agricultural subsidies, and also the abandonment of unfertilised and traditionally-managed grasslands (e.g. Erhardt 1995; Munguira 1995). While national parks and nature reserves have been created to protect some habitats, there is as yet little information on the effects of agri-environment schemes on the threatened butterfly fauna of these countries. We would be very interested to hear from anyone who may have information or has plans to gather any.

Maintaining low intensity farming systems

Agri-environment schemes appear to be attractive to farmers, with a widespread uptake, and have generally been successful in slowing the recent rapid loss of unfertilised, traditionally-managed grassland.

There has also been some progress towards the restoration of habitats. An important feature of ESAs in the UK is that the whole farm must be entered into the scheme. When applied imaginatively and in an integrated fashion, areas of surviving grassland can be linked by restoration projects. Because of their habitat specificity and rapid response to change, butterfly populations may be a particularly useful way to monitor the effectiveness of such schemes.

While historical reasons for decline continue to be important for threatened butterflies, a crucial factor determining their future survival is how appropriate agricultural systems can be maintained in the long term. Many unfertilised grassland sites are unsuitable for commercial livestock breeds and appropriate grazing regimes can be impractical for the farmer. Although it may be possible to maintain some important colonies of threatened species on nature reserves and other protected areas, their effectiveness is usually limited by their small size and isolation. Experience in the UK shows that threatened species continue to be lost from nature reserves at an alarming rate (Warren 1993). It thus seems likely that only large-scale agri-environment schemes, such as ESAs, which have the potential to sustain traditional forms of low-intensity agriculture, can conserve species over a wide enough area to secure their future in the long term.

Monitoring, targeting, flexibility and expert advice

The case study on the marsh fritillary shows that the impact of schemes on key species can, however, be very variable. Little comparative information is available on other butterflies and the impact is likely to differ from species to species, according to how closely their habitat requirements match ESA prescriptions, which are set for a whole variety of agricultural and ecological reasons. It is clearly important that these impacts are monitored so that schemes can

be improved as they develop.

While agri-environment schemes may be directed at supporting traditional and/or less intensive farming as a means of reducing agricultural surpluses, and to maintain rural communities, it is also vital that they meet nature conservation requirements, and protect farmland biodiversity. They must therefore be targeted at priority habitats and species, such as those listed in the Habitats and Species Directive, and retain enough flexibility to allow them to be tailored to the specific nature conservation features of the sites concerned.

This process can become very complicated and expert advice needs to be readily available to farmers on the ground. Non-governmental conservation organisations such as Butterfly Conservation are able to offer advice on threatened species, and may be able to help to train agricultural advisors, but resources from Government need to be made available to obtain the best outcome for farmland biodiversity, farmers and the wider public.

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The importance of open habitat for butterflies in the midwestern USA

The lushly productive North American grasslands known as tall-grass prairie are centred around and between the cities of Chicago (Illinois) and Des Moines (Iowa), with deciduous forest to the east and shorter steppes of the more arid Great Plains to the west. No butterfly is entirely restricted to tall-grass prairie, as all known species also occur either further east or west. However, a number of butterfly species have their largest and/or most populations in tall-grass prairie. Unfortunately for these prairie-specialised butterflies, the tall-grass prairie that once extended over 700,000km^2 has been about 99% destroyed in the last two centuries, primarily for intensive agriculture (tillage, heavy grazing, frequent hay-cutting). Yet no known prairie butterfly has become extinct.

Habitat remnants

Habitat remnants – often isolated and degraded – have survived by the occurrence of rocky soil or steep topography, remoteness from the farmhouse, or the unintensive husbandry of lightly grazed pastures or hay fields which are only cut once per year or less, that some families have practised from generation to generation. Impressive diversities and densities of prairie-specialised butterflies (and the native prairie flora they require) inhabit these sites, whether they are private farms or conservation sites that still retain light agricultural practices. By contrast, removal of such management – completely resting the site – is less favourable for native species, as the prairies often eventually brush in and weed over in the absence of any management. These general patterns are apparent not just in the prairie study my husband Scott Swengel and I have conducted at over 100 sites in six states since 1988, but also in the observations of numerous other researchers.

Ann B Swengel

Parallels with Europe

These results parallel those of European grassland conservation. My colleagues across the Atlantic have also recognised the conservation benefits from unintensive agriculture and lamented this polarising trend in agricultural economics today: toward either greatly intensified land use or toward abandonment of marginal lands altogether.

The biggest difference I've noted so far? Although light grazing appears equally outstanding for birds on both continents, in Europe grazing appears relatively more favourable than mechanical cutting for insects than in America. It is unclear whether we have just not yet stumbled upon optimal grazing regimes in North America, or whether this is a fundamental difference.

Burning versus grazing

A number of tall-grass prairie remnants have been conserved and placed in generally accepted ecological management, which leads to the biggest surprise of our research. From the point of view of prairie-specialised butterflies, reserve management could certainly afford to adopt many practices from unintensive agriculture. Most reserves are managed with fire, typically rotated around the site over 2-6 years. While prairie-specialist individuals can be found in recently burned areas, as a group these butterflies are scarce shortly after fire and gradually increase in numbers over the years. Specialist butterflies are typically much more abundant and stable in numbers

Mo-ko Prairie, Missouri, which is managed with rotational hay-making. Inset: regal fritillaries *Speyeria idalia* mating on pale purple coneflower *Echinacea pallida*.

Ann B Swengel

Taberville Prairie, Missouri. The area on the left was cut for hay the previous summer and the area on the right two summers' previous. Unfortunately, it has been burned several times since the photograph was taken. Inset: a pair of Leonard's skippers *Hesperia leonardus* mating on coreopsis *Coreopsis palmata*.

under light agricultural management. Of course, some species are more tolerant than others of fire management in moderation, while others are less tolerant of grazing or hay-making even in moderation. Also, some are more flexible about acceptable management types than others, which can be very narrow in their management tolerance, but, of course, do not agree as to what specific regime is ideal. Because prairie vegetation regrows lushly after fire and because historical documents vividly testify to the occurrence of past fires, ecologists inferred that fire is a crucial element of naturally healthy prairie. Other 'elements' like grazing and browsing herds of ungulates are also largely missing today, and the modern hay-making and grazing that prairie butterflies prefer seems to resemble that more. No one can know exactly how any of these components actually transpired over the millennia of prairie prehistory, much less how they affected the biodiversity we must now take deliberate action to retain in the modern landscape.

Thus, the resonance with European experience continues. Reserve management based on general conservation precepts of the time may not reliably favour the persistence of localised insect populations. Their successful conservation largely depends either on chance or on the application of detailed expertise on the individual species, which cannot be adequately intuited simply from general knowledge and management practices of their preferred habitat.

Importance of low intensity agriculture

Grassland species also pose theoretical challenges on both sides of the Atlantic. Given that there are so many open-habitat species native to Europe, was this continent really so thoroughly forested prior to agricultural land uses? Authors, such as the late Colin Tubbs, have raised this point here and elsewhere. Is the prairie ecosystem really 'fire-dependent' if suites of insects largely restricted to this habitat are so averse to burning? Did European species really co-evolve over the millennia with the developing agricultural landscape, or did certain components of this landscape simply happen to favour the continued persistence of these species? After all, their American counterparts are favoured by the same general sorts of unintensive agriculture, which have only been in place for a century or two.

I would gladly leave such abstract theory to the great thinkers, except for its profound practical effect on what is thought to deserve conservation and how. Might one suppose that grassland species may continue their co-evolution as our agricultural landscape keeps on evolving? But we seem to observe repeatedly today on continent after continent that open-habitat species persist in a landscape dominated by agriculture which to some degree happens to offer the conditions they have always required, whether the analogy between such agricultural practices and pristine prehistoric ecology is clear or not.

My thoughts repeatedly return to this simple truth: some amazingly biodiverse land in unintensive agricultural use is under pressure to change. Society may choose to encourage or subsidise unintensive agriculture for a variety of reasons, but biodiversity benefits all the same. Should such lands become the responsibility of conservation authorities, I fervently hope they increasingly appreciate the contribution that unintensive agriculture has made to their wonderfully biodiverse condition.

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Scientific publications of Swengels' grassland research (available from the above address):
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