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British Agriculture and Wildlife: Twentieth Century Change and Opportunities for the Future

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Abstract

Aside from the views of pioneer thinkers and romantics, perception of the relationship between agriculture and the countryside by the general public has changed this century from acceptance of the *status quo*, to increasing consciousness of environmental problems. Recent global and European initiatives now arguably form the basis of a strengthened package of anti-surplus and agri-environmental measures. Within their scope, biodiversity could effectively be enhanced by appropriate management of existing relicts and by engineering habitat gains through such measures as the redesign of fields. More fundamentally, it could be achieved by an ecological approach to the agricultural system and in particular, by a more general shift towards organic farming. Prospects for the latter will depend on a number of factors, not least an increased market share for home-grown organic produce. The viability both of organic farming and wildlife initiatives will in the longer term depend on wider community participation, thus reversing a trend set at the start of the Industrial Revolution.

conservation; and a phase of measured reconciliation between agriculture and the environment in the context of a multi-purpose approach to countryside management. Each phase is based on a set of value judgements relating to the level of economic prosperity, the political influence of farmers and landowners, and the trend towards growing environmental awareness amongst the general public.

The conservatism and compatibility phase: 1900 - 1950

The first 50 years of the century saw gradual changes in agriculture but only limited awareness of the implications of their impact on the countryside and its wildlife. Each generation tends to adopt a nostalgic view of the past, and from the perspective of the post-World War II era, the first half of the twentieth century may seem to represent one of traditional mixed farming, which fostered a diverse and stable wildlife. Non-intensive and largely non-mechanised farming methods maintained a countryside rich in colourful meadows, thick hedges and unpolluted watercourses, interspersed with patches of woodland and wide expanses of upland pasture. Such traditional mixed farming systems posed little apparent threat to wildlife and indeed, farmers were viewed as the creators of the countryside and therefore its custodians. When the 1947 Agriculture Act was passed, despite warnings from such forward-thinkers as Huxley and Rothschild, the advancing danger to landscape and wildlife was largely ignored.

However, the apparent beneficence of traditional mixed farming towards our wild flora and fauna was the result of economics rather than farmers' inherent interest in nature conservation. Firstly, many of the features of the farmed landscape which contributed to nature conservation were valuable economic assets to the pre-war farmer. The hedge formed a stockproof barrier and a linear coppice, from which useful wood and timber could be obtained. Farm ponds were necessities for watering stock, whilst the unimproved grassland of road verges and field edges provided an extra hay supply. Secondly, the depression of the

information in its report, 'Nature Conservation and Agriculture' (1977), which documented habitat losses and made dire predictions, subsequently justified, for decreasing species numbers on farmland, particularly in the lowlands, if current trends continued. Richard Mabey, writing in 1980, summed up the conservationists' anxiety: "What is remarkable is that a wildlife that succeeded in surviving - relatively intact - alongside an increasingly intensive agriculture for at least 3000 years, should seem to be in such peril from the advances of the last thirty".

By the beginning of the 1980's, battle had been joined between conservationists and the farming community. The debate had been extended from the perceived evils of modern farming methods to encompass questions of access and land ownership. Writers like Marion Shoard (1980, 1987) accused farmers of 'the theft of the countryside' and advocated the extension of planning controls to agricultural land. However, not everyone saw farmers as the sole villains of the piece; some, like Fitton (1981), accepted a wider apportionment of the blame: "If there has been theft of the countryside then the whole community has aided and abetted it by its support for post-war agricultural policies."

The consensus and reconciliation phase: post 1980

During the 1980's and 1990's the confrontational phase has begun to give way to the politics of consensus. The Wildlife and Countryside Act, 1981, despite its many shortcomings, was a step in the direction of reconciliation, particularly through the controversial introduction of compensation payments for profit foregone to owners of Sites of Special Scientific Interest (SSSI's). Although much criticised by conservationists, the principle of compensation was later extended to the concepts of Environmentally Sensitive Areas (ESA's) and Set-Aside, and is now regarded by many as a key step in the move away from price support mechanisms towards direct income aids to farmers (Potter, 1991). Public outrage at agricultural surpluses

future food security is one of the cornerstones of EC agricultural policy so that to maintain potential arable area as Set Aside is seen as prudent.

Faced with hints of a reduction in subsidies for some farming enterprises, such as low intensity upland farming, some observers are now calling for measures to support agriculture directly, rather than grants for specific conservation projects (Bignal and McCracken, 1993). The wheel has come full circle and the farmer is now re-emerging as the perceived guardian of the rural landscape, albeit wearing a new, greener coat. The appearance of a new White Paper (DOE/MAFF, 1995) gives grounds for hope that a new partnership between countryside managers and countryside users will be fostered. Nature reserves and SSSI's will be seen as centres of genetic diversity from which the variety and interest of the greater countryside can be renewed. It is essential to provide a framework for maintaining that variety and interest now, before the full impact of genetic engineering begins to be felt. In the following sections we outline some ideas for achieving this.

Fields as an expression of technology

A century ago, across agricultural Britain, a 25 acre (10ha) field was a very large one; indeed fields not exceeding a hectare were commonplace (Eyre, 1955) (Fig.1). It was in the semi-shade of their walls and hedges that the rich flora of agricultural Britain developed (Tansley, 1953). Into this landscape came combine harvesters, drills and cultivators in the mid-20th century, followed rapidly by later generations of ever-increasing size and inflexibility. Their ancestors came from The Great Plains of North America where, apart from the occasional strand of barbed wire, no hedgerows intervened. They had no traditions concerning the negotiation of small fields and curving hedgerows. First, the gateposts had to go, and then the hedges and hedgebanks. But even large fields have corners, and these are the main problem. How nice it would be, with advancing bad weather, if the combine or the drill could push on without slackening, reversing or running empty!

Grants, farmers may now plan long-term habitat development either in existing wild areas or on previously arable land. Let us consider what might take place on existing arable areas.

Conservation and Patterns of Cultivation

Many farms have at least some awkwardly-shaped fields, parts of which could be permanently set aside for wildlife habitat with positive management gains to the farm. A more revolutionary approach would be to increase the habitat potential of hedgerows and copses by creating broader curves at field corners which could, according to circumstances, create 'island' habitats of roughly diamond shape at hedgerow intersections (e.g. Thomas *et al.*, 1991). This strategy would, of course, be preferable wherever ditch maintenance wasn't essential, where hedgerows of diversity already existed and where gate access was not limiting. This approach is illustrated in Figure 2.

Further ideas can also be envisaged. A number of farming estates now take large areas of potential arable and cultivate regular rectangles of crop within them. The total area, which may have some boundary irregularities, has been used previously for crops and thus qualifies for Set-Aside payments; the regular rectangle earns income from a crop. The advantage to the estate is that sowing or harvesting can proceed without check: because there is a wide zone all around the crop, the machine can run empty, circling either left or right, and re-enter. The advantage to the Ministry is that the crop area can be accurately assessed. There could, for example, as in Figure 3, be a tract of 42 ha (700 x 600m), with maybe some awkward boundaries, surrounding a rectilinear crop area of exactly 25 ha (A). In the zone immediately around the cropped area (B), fallowing would continue. Here, the effects of traffic and abrasion would expose bare soil so that weeds of cultivation would need controlling. But beyond this disturbed zone conditions could be very different provided trampling, rutting, dumping and gratuitous applications of herbicide were strictly avoided. Here, conservation

consequences given the recent declines in commodity price support. Indeed, one might be tempted to think that the best hope for farming and wildlife is offered by agricultural practices which simply reduce costs. In this respect there is now much interest in the field of alternative or integrated farming which is being promoted both by MAFF and the organisation LEAF. While the latter is to be preferred over conventional intensive farming, its underlying philosophy is still little more than the economic optimisation of inputs (National Research Council, 1989) rather than involving any fundamental systemic change. On the contrary, organic farming needs to be seriously addressed, for rather than offering farming with periodic acts of conscience towards nature, it can deliver a genuine balance between farming and wildlife.

Organic farms and biodiversity

Organic farms are rarely single enterprise units and raise stock and crops on fields under rotation. There is no concept of wastes, for production from one part of the system forms, to varying degrees, the raw material of the other (Balfour, 1976; Lampkin, 1990). The aim of the organic farmer is to create a self-sustaining or closed system as far as possible and to work with biological processes to build up soil and farm life as if the whole were an organism. Earlier we remarked how simplified were agricultural ecosystems so that in modern farming each problem typically has a separate solution. Organic farms are designed to promote more complex interactions which work towards ecological sustainability (see Figure 4.).

The rotation adopted is usually a compromise between the needs of the farmer and the needs of the land. It aims to balance the requirement for plant nutrients while restraining the tendency of pests and pathogenic organisms to build up over time, as when a single crop is repeatedly grown. In short, it implies a diversity of organisms related to the sequence of

There is, of course, a counter argument that lower intensity agriculture leaves less scope for developing wildlife habitats and that their greater frequency could be achieved under intensive farming (Moore, 1987; Adams, 1990). Such a view necessarily ignores the consequences of intensive farming both on the fields it occupies and on the habitats it seeks to promote. Organic farming was described by the Nature Conservancy Council (1990) as providing greater protection for wildlife than conventional systems while the World Wide Fund has recently reported on a four-year study (funded by WWF and MAFF) which unequivocally confirms the superior quality of habitats on organic farms for a variety of wildlife, including many bird species, some of which are endangered by intensive farming (WWF, 1995). Furthermore, the existence of mixed farming and rotation significantly reduces the incentive for removal of field boundaries, thus securing these habitats for the wild flora, insects, birds and mammals which depend on them, and from which the various types of agriculture and horticulture benefit. Finally, comparisons of long-term soil losses under conventional and organic systems (Arden-Clarke and Hodges, 1987b; Reganold *et al.*, 1987) leave one in no doubt that the case for organics must now be pressed.

Prospects for organics

Accepting that the ability of an organic farm to deliver environmental objectives is no less a function of good management and farmer motivation than on any other type of farm, it seems that the organic route could offer substantial gains in environmental protection and biodiversity before the further, important question of food safety has even been raised. But does anyone actually care? Is this not the form of agriculture which we have loved to malign and marginalise over the years, which offers few prospects for multinational chemical companies and which is therefore best avoided by politicians? Given the fact that less than 1% of farms in the U.K. are organic, isn't it a non-starter? Even five years ago this might have been so, but organic farming, through the Organic Aid Scheme, is now established in

There is then the question of the inherent characteristics and safety of organic food. Even on present evidence it seems likely that significantly greater savings than those just mentioned (mainly to the NHS) could arise from healthier eating, of which part of the picture could be provided by the wider availability and consumption of organic produce. In its White Paper 'The Health of the Nation' the government shows its awareness of the problem but lacks the commitment to a co-ordinated policy involving both MAFF and the Department of Health. This should include a high profile programme of health education as well as an expanded programme of research in the field of diet and health.

Organic farming has also to address certain of its own problems. Many such farms are small. Could such a system adapt to large areas without compromising its principles and without changes in farm structure? Indeed, how might large specialised conventional farms convert to organic husbandry, and can one visualise stockless organic farms? The latter is already an issue on the European mainland (Boencke, 1995) and if the organic movement is ever to occupy centre stage it must be flexible in relation to the production and transfer of organic materials. In this respect, farm partnerships and co-operative ventures could well represent a widening of the concept, introduced earlier, of the farm 'organism'.

Farming, Wildlife and Community

The post-Rio agenda has shifted conservation policy further towards the countryside at large, and in recognising the link between viable rural areas and countryside management (DOE/MAFF, 1995), the government should now do more, not only to help farmers achieve conservation objectives but to recognise that beleaguered Local Authorities have a distinctive role to play.

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Fig 2. Theoretical freeing of land for conservation by the rounding of iguous field corners

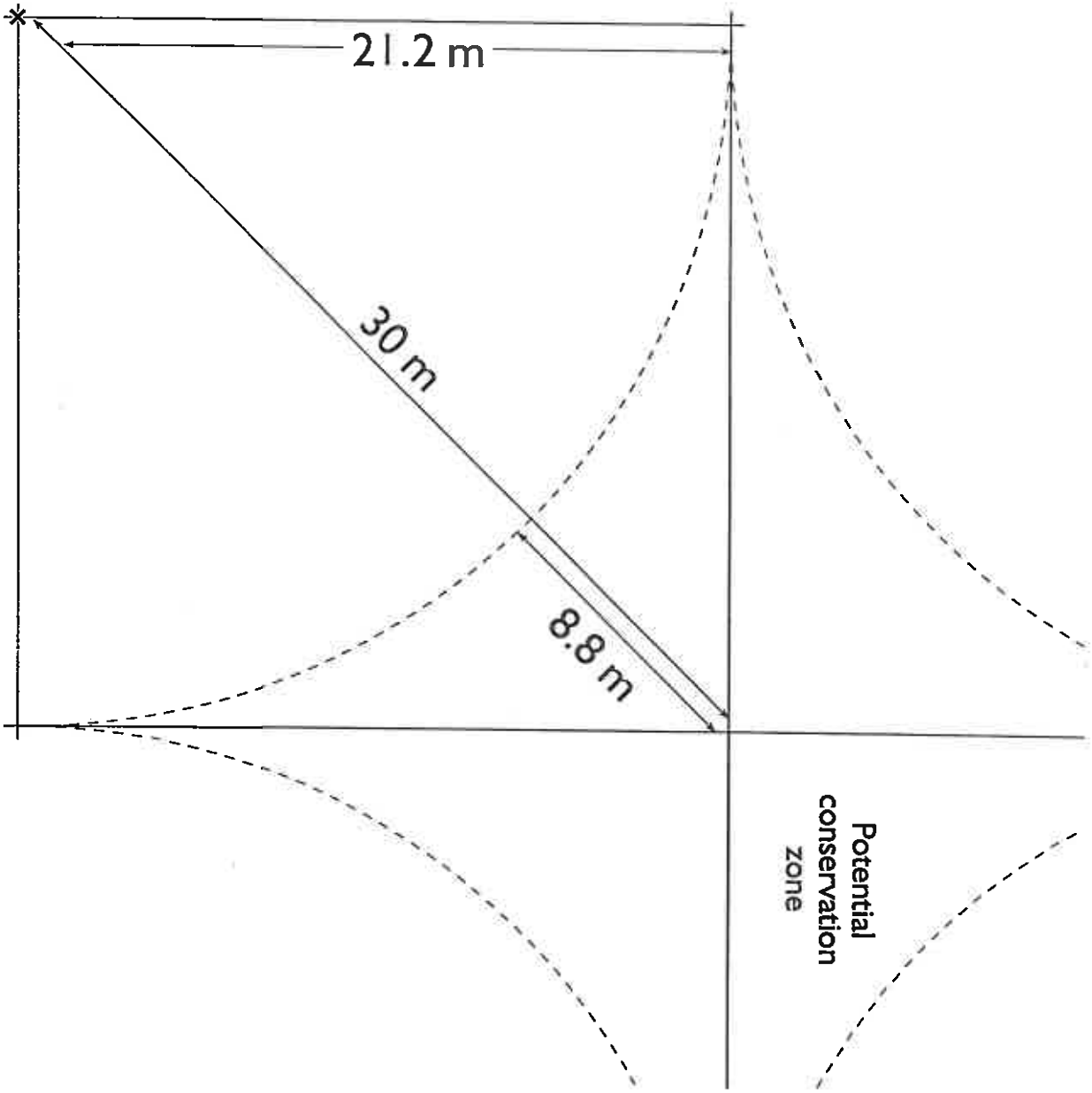

Fig 4. The realationships within organic-ecolgical farm systems