THE DIVERSION OF LAND

Conservation in a period of farming contraction

CLIVE POTTER

PAUL BURNHAM · ANGELA EDWARDS · RUTH GASSON · BRYN GREEN

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Chapter one
Degrees of freedom

Introduction

In an influential book first published in 1970 called *New Lives, New Landscapes,* Nan Fairbrother presented a refreshingly bold and imaginative picture of how the British countryside could change during the last three decades of the twentieth century. Fairbrother argued that new landscapes would have to be created to suit the new tastes and lifestyles of an industrial bureaucracy, landscapes tailored to the needs of an increasingly affluent, mobile and leisured society. Planners and policy-makers were exhorted to reject the narrow conventions of post-war countryside planning, seizing instead the opportunity to be much more interventionist in the way they set about planning the urban fringe, the farmed landscape and the great expanses of remoter upland countryside in the national parks. The challenge was to translate changes in society into changed environments and to do so with confidence and imagination because

> A negative policy of not disturbing the old cannot for long succeed. We must disturb it to survive—on a vast scale and everywhere…. In the period since our landscape was created the changes have been more sweeping than in the thousands of years before, yet the translation of social change into changed environments has still barely started.
>
> (Fairbrother 1970:14)

Twenty years after these words were written, Fairbrother's vision of widespread public intervention in planning and managing the British countryside has still to be realised. In the early 1990s, the conservation effort is still piecemeal and small scale, closely tied to preserving a heartland, a 'core landscape' which has historic or habitat or landscape interest (House of Commons 1985). It is an approach dominated by what Redclift (1987), in another context, has termed 'environmental managerialism', an attitude of mind which, by stressing the separateness of conservation problems from wider issues of production, efficiency and distribution, is forced into a position of continuous accommodation with producer interests.

Far from being able to develop policies and procedures which can translate 'new lives into new landscapes', environmental managers in government conservation agencies like the National Park Authorities and the Nature Conservancy Council (NCC) in the UK

have had to adopt a defensive posture in their attempts to protect designated conservation sites and heritage landscapes. Until very recently, change in the countryside was still being wrought by the developers (farmers, foresters and industrialists) and only rarely by environmental managers themselves. Indeed, successive governments have permitted a set of productivist agricultural and forestry policies to interact with technological changes in ways which have reduced the quantity, diversity and continuity of habitats, eroded the consistency of landscapes and limited the accessibility of agricultural land (Bowers 1988; Hunting Surveys and Consultants 1986).

To an extent, this state of affairs is a reflection of the greater strength and influence of corporate producer interest groups compared to consumer and conservation interest groups in a policy process which operates through 'bureaucratic accommodation' (Cox *et al.* 1986). A corporatist relationship between the farm lobby and the state has ensured that high levels of farm support are maintained and structural adjustments suppressed, even in the face of increasingly severe over-capacity and a shrinking market.

The story of post-war countryside change has been told elsewhere (O'Riordan 1983). Only a summary will be given here. Precisely how the Common Agricultural Policy (CAP) can be said to have played a leading role in bringing about the more intensive and specialised patterns of land use that are the hallmarks of post-war countryside change, is still a matter for debate (Bowers and Cheshire 1983; Cheshire 1985). The efforts of researchers to unravel the complexities of agricultural change in order to isolate the relative influence of the CAP, technological progress and wider macroeconomic factors are only just beginning to bear fruit (Buckwell 1989). Basic economic theory suggests that the CAP has certainly induced farmers to farm the land more intensively by making it more profitable for them to bring previously marginal land into production and to apply greater amounts of non-labour inputs (fertilisers, pesticides, sprays) to each hectare of land already in production. There have been changes on both the extensive and intensive margin of production. At the same time, by making farming more profitable, policy-makers have encouraged more people to enter the industry. This, together with the expansion of existing farms, has raised the demand for land and, subsequently, led to the inflation of land values and rents. Meanwhile the conditions have been created, through research and development and through the climate of security engendered by price guarantees, for more and more farmers to climb on to a 'technological treadmill' (Dexter 1975). This in turn puts pressure on farmers to become more specialised because once on the treadmill of buying new machinery and equipment, the emphasis is on achieving economies of scale in the use of what are high-technology systems. A combine is a large capital asset which must be used to harvest a large area if it is to be economic. With few opportunities to buy or rent more land in order to expand the scale of an enterprise, farmers have typically reduced the number of enterprises on their farms and increased the level of throughput in those that remain. The implications for the farmed landscape of the resulting decline in mixed farming have been profound.

The detailed environmental impact of these twin processes of intensification and specialisation has been widespread but uneven. In the lowlands, the traditional farmed landscape has been transformed by a technological and chemical revolution in farming methods. The decline of the mixed farm and its replacement with specialised, intensive. systems has meant that hedges, small woods and hedgerow trees have been swept away by farmers anxious to remove now redundant and inconvenient features (Countryside

Commission 1974). The regional distinctiveness of the British countryside also continues to decline, with the result that it is increasingly unusual to find landscapes which are characteristic of a particular locality or region (Westmacott and Worthington 1984). Meanwhile, official attempts to reconstruct these landscapes or in some way ameliorate the effects of farming change have met with only limited success. A great deal of emphasis has been placed on voluntary action by enlightened farmers who are encouraged to undertake conservation investment with the aid of grants and advice. Under this much-vaunted 'Voluntary approach', an attempt has been made to recruit the methods of agricultural extension to conservation in the hope that good conservation practice will be diffused throughout the farming community, though it has been pointed out that planting a few trees in fields hardly compensates for the grubbing of a wood, nor making a new pond for the drainage of a marsh. Conservation undertaken by farmers is growing but all the evidence points to a thinly scattered pattern of investment that is concentrated on too few farms to have much impact on the general appearance of the countryside or on its conservation value (Potter 1986).

A more recent concern, and one likely to grow in importance, has been the increasingly evident unsustainability of modern farming practices. The incidence of soil erosion and agricultural pollution, particularly from slurry and nitrate leaching and run-off, is increasing throughout the intensively farmed countryside. According to Evans and Cook (1986) for instance, about 9 per cent of the agricultural area of England and Wales has suffered from significant wind or water erosion in the recent past, typically in situations where heavily compacted and intensively farmed arable land is bare of crops. The pollution of aquifers from nitrates that are leached through the soil and the eutrophication of water courses due to the run-off of nitrates and slurry is also well documented (DoE 1988) and an issue of considerable public concern.

In the uplands, agricultural change has operated in a more complex way, with the reclamation of large tracts of semi-natural vegetation going hand in hand with the amalgamation and loss of farms. In these areas, the intensification of farming, far from strengthening the rural economy has produced depopulation and social decline (MacEwen and MacEwen 1987). Headage payments available under the EC's Less Favoured Areas (LFA) policy, together with the benefits of the sheepmeat regime, have encouraged many of the better-placed livestock farmers to reclaim, improve and over-stock the land, with predictable results for large tracts of semi-natural habitat in the national parks. At the same time, smaller and more marginal producers have found themselves disadvantaged by a system which rewards output and the ability to expand output through capital investment. Far from stemming the depopulation of upland countryside, the combined impact of headage payments, land improvement grants and other benefits which accrue under the EC's sheepmeat regime has been to accelerate the rate of farm amalgamation, reducing the number of hill farms, farmers and farm workers by creating fewer but more productive units. For this last group, 'survival has depended on expansion and on increasing output per acre and per man by improving grassland, intensifying stocking rates and other techniques' (MacEwen and MacEwen 1982:103). By comparison, conservation agencies such as the National Park Authorities and the NCC possess few powers to influence the decision making of the individual farmers and foresters whose actions shape the landscape and ecology of these much-prized upland landscapes. Without new powers to regulate and control farming change, planning tools

such as National Park plans are little more than vehicles for sharing information about conflict (Shaw 1982).

It has been remarked that these changes have taken place at the very time when more people want to enjoy the countryside and have the leisure and mobility to do so (Green 1985). Fairbrother's formulation has seemingly been turned on its head as rural environments have been reduced and impoverished when social trends suggest they should have been improved and enriched. What amounts to a complex re-evaluation of rural space by a predominantly urbanised society (Clout 1980) has been reflected in the explosive growth in membership of conservation organisations over the last decade and in the buoyant public demand for recreation in the countryside (Table 1.1). According to the Countryside Commission, up to 18 million people spend their summer Sunday afternoons in the countryside, walking, picnicking or simply sitting in their cars. Around 2 million will still venture out on a typical weekday in winter (CC 1985). Numbers like these are a tangible reminder of the value our society ascribes to that peculiarly enduring British idea, the countryside. But the growing political influence of conservation bodies in government reflects a more deep-seated and subtle set of changes in public attitudes, partly connected with an anxiety on the part of those who already live in rural areas to defend their 'positional goods' (Hirsch 1978), but also because of a more widespread and selfless concern with protecting wildlife and beautiful landscapes. In a formal sense, the countryside, its landscapes, wildlife and amenities, are all important public goods which are currently not being supplied in the quantity and quality that consumers or potential consumers might wish. They are underproduced by an agricultural industry that has been geared up to produce only food and fibres, nor are they being fully provided by government through its conservation policies and agencies. In encouraging the expansion of farming output and in fostering a particular structure of agricultural production, policy makers have overlooked the very considerable social costs associated with

Table 1.1 Membership of countryside and environmental groups, 1971 and 1987

Group	*1971*	*1987*	*Percentage increase 1971–1987*
National Trust	278,000	1,404,181	505
Royal Society for the Protection of Birds	98,000	529,000	539
Royal Society for Nature Conservation	64,000	180,000	916
Friends of the Earth	1,000	28,500	2,850

Source: Hamnett et al. (1989:27)

modern farming. They have also, of course, brought about the over-production problem that has threatened to bankrupt the CAP.

In an important sense there is a logical connection between the environmental crisis in the European countryside and the financial crisis confronting the CAP, which is rooted in the changing pattern of consumption in developed, post-industrial societies. This is

because the affluent individual who now has the time and mobility to enjoy and appreciate the countryside and who is anxious to exercise an option on future landscapes is also the consumer who, according to a cast-iron 'law' of economics, spends proportionately less and less of any extra income on food. Engel's Law means that agriculture is a declining industry because, with limited export opportunities, its market is continually shrinking (Duchene *et al.* 1987). Yet on the supply side, continuous technological change in agriculture and the resulting intensification of land use, shifts the supply curve upwards as farmers become more productive. Slowly but surely the supply of farm products has overtaken demand, putting downward pressure on output prices and making the artificial support of those prices ever more costly. It is the financial crisis resulting from this which is finally bringing the agricultural expansion of the last forty years to an end and, in the process, creating the environmental opportunities that are the subject of this book.

More immediately, the financial crisis is a symptom of a series of contradictions in the relationship between agriculture and the state and in the inconsistent way in which policy instruments have been deployed under the CAP. By attempting to support the incomes of marginal producers through the maintenance of high prices, for instance, policy makers have at the same time over-rewarded the more efficient producers who, by expanding output and taking advantage of technological innovation, have created the food surpluses. The inherent weakness of the CAP is that it has relied on a single, undifferentiated policy of price support both to balance markets and to support farm incomes. The declared aim of reformers is to uncouple these two objectives, reducing price support so that farm prices can provide the right signals to farmers about the state of agricultural markets. At the same time, income supports, more direct and 'transparent', will be provided to farmers where social and environmental considerations merit. As will become apparent, this uncoupling is the crux to realising the environmental opportunities created by food surpluses.

Overproduction

The financial crisis facing the CAP has been inevitable for some time, though various factors such as the sudden expansion in export markets in the mid-1970s, meant that it was initially delayed or disguised. In retrospect however, these were merely safety valves which did nothing to resolve the fundamental limits to continued expansion. In the early years of the CAP when levels of self-sufficiency were much lower than they are now, prices were effectively held up by imposing levies on food imports from countries outside the EC. Receipts from these levies financed a large part of the total expenditure. This changed once self-sufficiency in certain products like milk and cereals exceeded 100 per cent, which it did in the 1970s (Table 1.2). At this point the authorities were forced to buy up any excess production, removing this from the market in order to maintain prices. These excess supplies were then stored or sold on world markets with the aid of export subsidies. By the early 1980s the CAP was being overwhelmingly financed by receipts from Value Added Tax (VAT) levied in the member states. Table 1.3 shows the level of gross expenditure under the CAP. A financial crisis was eventually precipitated when the

rate of growth of farm spending required to maintain farmers' incomes through price support began

Table 1.2 EC self-sufficiency in selected products

Group	*1980/81 %*	*1985/86 %*	*1986/87 %*
Durum wheat	101.7	121.3	145.0
Common wheat	125.6	119.9	119.0
Barley	116.0	125.2	117.2
Sugar	128.5	129.2	113.7
Beef/veal	102.2	106.2	107.6
Sheepmeat	74.2	78.7	78.9
Milk	100.4	100.5	100.5

Source: Eurostat, various sources

Table 1.3 Expenditure under the guarantee section of the CAP, 1986 budget

Budget head	*Expenditure million ECUs*	*% of total*
Export refunds	8613.0	38.9
Price subsidies and guidance premiums	8316.5	37.5
Storage and withdrawals from market	5217.3	23.6
Total expenditure	22146.8	100.0

Source: Commission of the European Communities (1987)

to outstrip the growth in 'own resources', as the combined receipts from VAT, import levies and customs duties are known. In 1987 spending on price support was 2,750 million over budget.

At a meeting of the European Council held at Fontainebleau in 1984, farm ministers had agreed that this state of affairs could not continue and that in future the money spent guaranteeing prices must not be allowed to outstrip the growth of 'own resources'. By this time, action was needed to avoid a financial crisis. A later agreement to raise the proportion of receipts from VAT which member states contribute to the EC funds from 1.0 to 1.4 per cent in January 1986 eased the immediate problem of insolvency, though it was recognised that the extra resources which this provided would be swallowed up unless farm production could be cut. Meanwhile, the dumping of European surpluses on world markets had led to friction in the other trading nations like New Zealand, Australia, Canada and the United States. The United States threatened a trade war. In 1985 the European Commission issued an important consultation paper entitled *Perspectives for the CAP*, in which it recognised that the CAP was at a crossroads. Farm output had to be reduced to bring spending under control. The favoured mechanism was to reduce the

level of price support which farmers received and to back this up with various more direct attempts at restructuring the industry. The problem was expressed in the starkest terms: agriculture, like other industries, had to be exposed to the rigours of the marketplace. For the first time, the farm problem needed to be solved through means other than farming expansion.

Degrees of freedom

The repercussions of this shift from farming expansion to contraction extend a long way beyond the farm gate to affect large areas of rural policy and the assumptions on which it is based. The 'agricultural fundamentalism' (Wibberley 1983) that so quickly established itself in the post-war era, when many of the principles underlying rural policy were agreed, ensured that the needs of an expansionist farming industry would be a formative influence. Development control under the town and country planning acts for instance is predicated on the assumption that 'every hectare counts'. With the onset of overcapacity in agriculture this is no longer a tenable basis for strict development control; there is now no absolute need to keep every hectare of agricultural land in a farming use and agricultural interests will find it harder to resist the claims of other land uses, whether of forestry in the uplands or, for example, the new settlements that conservation developers are planning to build on good farmland in the South and the Midlands (Bell 1987). Farming contraction and what can only be described as the dethronement of the conventional wisdom concerning the primacy of agriculture in rural areas, thus bring problems of competing land uses as well as opportunities for introducing new ones.

Some commentators have gone as far as to proclaim a watershed in rural policy. Much of the conventional wisdom about planning and managing rural land will certainly need to be overturned as farming retreats and development and conservation interests advance. There have been inevitable comparisons between the mood and outlook of the present and the years after the Second World War when the path-breaking Parliamentary Acts on agriculture and the conservation of the countryside laid a foundation for reconstruction. Statham envisages 'a challenging period in rural land use', and notes: 'the stark fact is that, given the surpluses and the rate of technological change, choices are open to us that were simply not available a few years ago' (Statham 1986:20).

In purely physical terms, the fact that a long period of farming expansion is gradually being brought to an end suggests a need to reassess the whole resource equation and to plan for a redeployment of land, labour and capital on an unprecedented scale. There is a larger project to be defined here. Paraphrasing Wagstaff and Leach (1986), we have a situation where technological change and a remarkable record of growing productivity in agriculture makes possible an enlargement of the range of activities which society can afford to support in rural areas. The challenge is to change the policies, institutions and property rights which affect the way rural land is used and managed to ensure that the fruits of technological progress, rather than accumulating as costly surpluses, are redistributed to benefit all users of the countryside. To put all this another way, if the starting point is the need to reduce farm output, then can this be achieved in ways which maximise rather than marginalise landscapes and wildlife and recreational benefits? Ignoring for the moment the simplifications which lie behind such a question, let us

briefly examine some of the different ways a physical reduction in agricultural capacity could be achieved and how this will affect the conservation interest.

In fact there are only two ways in which such a reduction might be achieved. The level of output is a function of both the amount of land in a farming use and the intensity with which every hectare of land is farmed (the quantity of non-land inputs that are applied to each hectare). Agricultural capacity can therefore presumably be reduced either by removing some land from production (the land diversion option), or by reducing the intensity of production on all the land which remains in production (the extensification option). It is surprising that amidst so much talk of 'choices' there has been relatively little discussion of which of these strategies is best from a conservation point of view. Certainly each carries with it a very different set of implications for wildlife, landscape and the level of agricultural pollution, as well as for rural society and the position of farmers.

The idea of reducing the intensity of production is certainly an appealing one. Extensification might be expected to have the enthusiastic support of those anxious to see a thoroughgoing change in the way large areas of agricultural land are farmed. The problem is that it is very difficult to pin the concept down in practical terms. At its simplest, extensification implies some reduction in the amount of inorganic fertilisers, pesticides and other farm chemicals that farmers apply to an area of land, together with reductions in stocking rates in appropriate situations. It could also mean using fewer mechanical inputs and hence a higher labour to capital ratio in the industry. Restricting fertiliser applications to a rate at which they can be absorbed by the soil and crops will presumably greatly ease the problems of eutrophication in water courses for instance, while a lowering of stocking densities on over-grazed moorland should improve the conservation of heather and slow down the invasion of bracken. In general though, we are still surprisingly ignorant about how a given reduction in some of the inputs going into the 'black box' of intensive agriculture will affect the eventual output of environmental goods (Traill 1988). In the case of nitrates in groundwater for instance, the complexity of the nitrogen cycle and the incomplete state of knowledge about the impact of the timing of fertiliser applications means that it is difficult to predict exactly how effective a reduction in nitrogen use will be in easing the problem (DoE 1986). In some cases a reduction in the use of some chemical and other purchased inputs could have a variety of undesirable results. Some dairy producers who cut back on their use of concentrates by feeding more home-grown grass to their herds have been found to reseed old pasture or upland grassland and generally intensify their grassland management for example (RSPB 1988).

There is also the question of how farmers are to be induced to use fewer inputs when they have been committed for so long to increasing output by further intensification. Some de-intensification, in a narrow sense, will undoubtedly be undertaken as a matter of good housekeeping and efficient farming by farmers squeezed by falling product prices and rising input costs. Many pesticides are applied cosmetically to produce a supermarket-ready crop and there is much wastage of fertilisers and other farm chemicals. Reducing the use of inputs beyond what might pass for good housekeeping is rather more of a problem. On farms where the use of nitrogen fertiliser is already at a finely tuned optimum, it may require a very high nitrogen tax indeed to induce any reductions in the rate of application. Evidence from Germany (Berg 1984) suggests that

in these situations cereal yields are so sensitive to reduced nitrogen applications that a doubling in fertiliser costs through a tax would lead farmers to cut applications by a mere 15 to 36 per cent. England (1986) maintains that as an instrument for reducing nitrate pollution in drinking water, punitive nitrogen taxes would be difficult to justify, so great would be the impact on the profits of arable farmers compared to the direct costs of simply removing the nitrates through water treatment downstream. Extensification, even in this minimal sense, appears to be no easy thing to achieve in practice, at least on a large scale. There are gaps in our knowledge about how farmers are likely to respond to different incentives and price relativities and we lack basic data on which to make predictions about the environmental benefits resulting from a given reduction in the intensity of farming.

By comparison there is more agreement about the value of farmers engaging in particular styles or types of extensive farming in an area. A strong supporter of what might be called low-input farming is Bowers (1988), who argues for widespread changes in the techniques of production and the introduction of a system of subsidies and taxes to facilitate their adoption by farmers. The assumption is that it should be possible to define particular farming systems and conservation technologies which are tailored to the production of what McInerney (1986) calls Conservation, Amenity and Rural Environment (CARE) goods. Farmers should be encouraged to adopt these technologies in the same way that they have adopted new techniques in the past. According to the Council for the Protection of Rural England (CPRE 1988), farmers should be able to follow a particular management regime which has been tailored to their own land type and existing farming system. This is clearly a long way removed from simply reducing the use of some inputs to improve good housekeeping. Organic farming is the best defined example of such an approach, based as it is on the need to maintain natural soil fertility through the use of rotations and organic inputs such as manure. There are presently some 1,000 organic farms in the UK. The Soil Association envisages that up to 10 per cent of farm output will be organically produced by 2000 (Soil Association 1988). Other low-input management regimes are less well defined, though the Royal Society for the Protection of Birds (RSPB 1988) discusses modified forms of mixed farming as likely candidates. As with simpler forms of extensification, the environmental impact of a widespread adoption of organic or some less ‘pure’ type of low-input farming is difficult to predict. The wildlife benefits of organic farming are largely untested, though it is likely that the elimination of pesticides would greatly increase weeds and insect populations. More varied patterns of cropping with fallowing rather than continuous monocultures could also increase the diversity of farmland habitats. Given that livestock are a necessary component of organic systems, their wider adoption could also help to maintain a pattern of mixed farming and the relatively intimate landscapes with which mixed farming tends to be associated.

All these are attractive possibilities. But is *widespread* extensification a realistic option when one considers the manifold difficulties associated with converting from existing intensive methods of farming? According to Barber and Wragg (1987), there is still a great deal of facile talk about changing farming systems. Conversion to organic farming, for instance, often takes a minimum of five years and will only be attempted by knowledgeable and committed farmers. The idea of a new landscape, fully occupied by an extensified agriculture, is an illusion because, without a radically different structure of

prices, only a minority of farmers will have the ability or inclination to make the necessary, very thoroughgoing changes to the way they farm. Even with very substantial government intervention it is still difficult to conceive of a general retreat from high-technology farming amongst large sections of the farming community, if only because the adoption of new technologies developed by the supply industries will continue to allow producers to reduce production costs and increase short-term profits. Having said that, a selective extensification of production may be possible and desirable; a state-supported sector of heritage farmers has already been prefigured with the Environmentally Sensitive Areas programme (see p. 32) and could be extended to encourage the adoption rather than just the continuation of extensive methods of production. But conservationists need to be clear that an extensification strategy could never be applied to all farmers or even a majority of farmers, given the nature of modern agricultural technology and the pressures which push farmers into adopting it.

The diversion of farmland or farmers remains, despite its immediate attractions, a controversial option for many conservationists. Compared to the idea of extensifying large parts of the farming industry—an appealing prospect to those committed to the still resonant notion of integrated land use—there is suspicion of the idea of marking off certain areas of land or parts of farms. For Ulbricht (1989:267) there is 'the horrifying prospect of really large areas of land going out of agriculture altogether, whilst others are farmed more intensively'. It is surely preferable, so the argument goes, to change the way every hectare of land is farmed and encourage farmers to adopt methods which produce food and conservation as 'joint products' on the model of the traditional mixed farm? Critics of land diversion point to the likelihood of a much more polarised countryside based on a sharp division between productive and non-productive sectors. It is argued that the land which remains in production would be farmed more intensively than ever before, particularly if prices stayed high, bringing greater pollution and virtually stripping certain parts of the countryside of conservation value and interest.

Much of the suspicion of land diversion as an idea stems from the long-standing North American experience with 'acreage reduction'. Here, vast areas of cropland have been temporarily and crudely set aside in an attempt to restore market balance for surplus crops. Experience shows that such programmes are costly, bureaucratic and ineffective. Yet the Americans have also used land diversion to solve certain soil and water problems which affect large areas of cropland. The advantage of land diversion in these terms is that it can be used to bring about shifts in the use of land, many of them permanent, which can greatly enrich the ecology and appearance of farmed landscapes. It can be carried out by farmers without (necessarily) involving the adoption of completely new styles of farming and may apply to parts of a field or an entire holding. As this book will attempt to show, it remains a powerful mechanism for translating the waste represented by food surpluses into new landscapes fit for the twenty-first century.

Conclusion

Both the diversion of land and the extensification of production have a place in the creation of new landscapes, though arguably over different spans of time. Extensifying production so that every hectare that is farmed produces both a conservation and a food

product is obviously ‘first best’ from an environmental point of view, if the aim is to bring about integrated land use at the scale of individual farms. But economic and technical barriers to widespread extensification mean that it has a limited role to play in the short or medium term. The diversion of land out of agriculture is a more flexible and practical mechanism for translating food surpluses into environmental benefits which can be carried out by large numbers of farmers.

This discussion has been useful then in clarifying some of the environmental implications of following different routes to reduced agricultural capacity. As was hinted earlier, however, it runs the risk of putting the cart before the horse. Neither of these strategies would be under discussion were it not for the need to reform the CAP and the chronic problem of overcapacity which lies behind it. Policymakers will not so much choose to extensify production and divert land as agree a set of incremental policy changes which will balance the need to reduce production and move resources out of the industry with the maintenance of farmers’ incomes and the protection of the rural economy. It is these policy changes and the way farmers react to them which will bring about land diversion and extensification, to a greater or lesser extent. Commentators like Buckwell (1989) argue that given the complexities and vicissitudes of the policy process, it is unsound and unwise to link the environmental and surplus problem in the way that this chapter has. ‘It may hook what are delicate and often national and site specific environmental problems to the juggernaut of a supranational agricultural policy’ (Buckwell 1989:150). Certainly it would be naïve to expect a magical transformation of food surpluses into a new and more spacious set of farmed landscapes. But the fact of CAP reform is an undeniably new feature in the agriculture and environment debate which is already changing the structure and pattern of land use and promises to do so further. The opportunities for conservation are possibly more complex and oblique than is often appreciated but they still exist. The next chapter therefore looks in detail at some of the strategies available to reformers in their narrow concern with reducing over-production. If these set the framework for realising environmental opportunities, which is to be preferred from a conservation angle and how can the farming changes which they bring about be best managed with environmental protection in mind?

Chapter two
Restructuring and adjustment

Few expect the restructuring of European agriculture to be either a quick or painless affair. Reducing over-capacity in any industry or sector requires a redistribution of income, wealth and power; it renders old skills and practices redundant and demands the development of new ones. It creates losers. These must be 'boughtoff' or coerced if adjustment is to proceed. In some cases, the losers or potential losers of large-scale restructuring have been able to organise themselves politically in order to slow down the process or put it off altogether (Olson 1982). In agriculture the influence of the farm lobby in the post war period has meant that under a protectionist CAP agricultural adjustment is long overdue. There has been a failure to reallocate some of the land, labour and capital now held in productive farming into uses that, arguably, would bring greater benefits for society.

Now that the budgetary crisis of the mid 1980s has finally made some sort of adjustment unavoidable, the question about how and at what rate capacity should be reduced is a hotly contested one. Producer interests, anxious to reduce the economic losses incurred by their members, have argued that it is land rather than labour or capital which is surplus to agricultural requirements. Farmers should be paid by the state to divert this surplus land into other uses, while presumably remaining in business themselves. The farm lobby is less easily persuaded that their industry is over-capitalised or that there are too many farmers on the land (Curry 1988).

Others nevertheless argue that the over-capacity problem is indeed ultimately due to an excess supply of farmers and that the only satisfactory solution is to buy them out in much the same way as dockers, steelworkers and miners have been bought out through redundancy payments. Many in the conservation lobby, on the other hand, favour a managed withdrawal of both land and capital from agriculture, arguing at the same time for the continued existence of small and marginal producers to avoid depopulation and dereliction in rural areas (Baldock and Conder 1985).

In principle, three different approaches to economic adjustment can be identified which have been applied to other industries in developed western societies in the past (Marquand 1988). What might be called state-led adjustment takes place when government and its agencies actually plan and execute the withdrawal of resources, often but not necessarily compensating the losers in the process. Market-led adjustment relies on the price mechanism to devalue and force out surplus resources, creating a smaller but presumably more efficient and competitive industry. Finally elements from both of these

approaches may be combined, with price changes determining the broad pattern of adjustment and the state intervening to speed up the process or slow it down in order to ease the pain of adjustment for certain vulnerable groups.

This chapter explores which, if any, of these approaches is likely to be applied to European agriculture as policy-makers begin to grapple with over-production. What do they mean in terms of the movement of land, labour and capital out of the industry and how will this affect the environment and the pattern of land use?

State-led adjustment

The closest policy-makers have yet come to a 'state-led' approach to European agriculture was in the late 1960s when Sicco Mansholt, the then Commissioner for Agriculture, produced his prescient, bold but inevitably controversial plan to streamline the industry. Mansholt's argument was that very many small farmers were effectively trapped in agriculture by the low salvage value of their tenant's capital (livestock, crops, stores, fixtures and machinery), running farms that were unlikely ever to generate a decent income. He recognised that using the CAP to support the incomes of these marginal producers by giving all farmers price guarantees would be costly and ultimately self-defeating. Mansholt correctly predicted that artificially raising farm prices to support the incomes of this welfare sector would also over-reward the economic sector of the industry—those large, super-efficient producers on the cutting edge of technological change. Setting prices to support the marginal farmer would inevitably result in too much being produced by the free-riding, expansionist producer. Mansholt foresaw that eventually a point would be reached when mounting food surpluses would necessitate price cuts. The difficulty for policy-makers would then be that in agreeing to price cuts sufficient to provoke a supply response from efficient producers, they would also imperil the survival of the marginal farmer. This of course is precisely the dilemma now facing policy-makers as they embark on the reform of the CAP.

The Mansholt Plan proposed that in order to avoid this state of affairs, the small and poorest farmers should be immediately paid off and encouraged to leave the industry. Clearly, he subscribed to the view that even in 1968 there were too many farmers on the land. The aim of the plan was to create an industry composed of large, viable producers who could still remain profitable and competitive in the low-price environment which would follow reduced farm spending. Expenditure on this so-called 'structural policy' was projected to take up half of the farm budget. Mansholt's size targets were: 18–20 hectares for wheat producers; 40–60 cows for dairy farms and 150–200 head of cattle for beef producers, all well above average farm sizes in these categories at that time. Significantly, Mansholt envisaged that the land released by retiring farmers would be diverted from agriculture into forestry or the creation of huge recreation parks. The farmed area in the EC was projected to fall from 71 to 66 million hectares by 1980 and the labour force would contract from 20 per cent of the working population to only 6 per cent over the same period. Mansholt evidently had in mind a massive redeployment of land and manpower (Table 2.1).

The hostile reception given to the Plan by farm groups and governments was no great surprise in view of the radicalism of its proposals. Member states refused to endorse it

because they feared the implications of agreeing to a muscular structural policy directed from Brussels. As Harrison (1975) reflects, structural policy has always been a fiercely nationalistic affair and power would not be easily ceded to the centre. Moreover, the plan envisaged speeding up the exit of farmers and farm workers when a majority of member states were passionately committed to keeping people on the land for cultural or ideological reasons (George 1986). The farm lobby

Table 2.1 Land use under the Mansholt Plan

	1970		*Mansholt Projection for 1980*	
	million ha	*(%)*	*million ha*	*(%)*
Cultivated Area	70.1	59.9	64.8	55.4
Woodland and forest	27.8	23.8	32.7	27.9
Other uses	19.1	16.3	19.5	16.7
Total Area	117.0	100.0	117.0	100.0

Source: CEC, various dates

opposed the plan because it would have meant a loss of members and hence a weaker power base as farmers left the land. The plan also implied extremely unpalatable price reductions for the larger producers who formed the core of the lobby. Although arguably a far-sighted and correct diagnosis and prescription for the industry, it was really doomed from the start. Louwes (1985) comments that in proposing his grand design of an agricultural society for the year 2000, Mansholt attempted to mobilise the poorer sections of the farming population over the heads of farmer groups where big producers have traditionally assumed a dominant role. He failed.

What emerged in the aftermath was a watered-down, lukewarm version of the plan. The consensus amongst agricultural economists is that the structural policies which then materialised contributed little to the effective restructuring or streamlining of production (Revell 1985). The structural measures that were eventually agreed in 1972 were very far removed from the sort of policies envisaged in the Mansholt Plan. Member states decided to ‘solve’ the farm problem, not by removing marginal farmers, but by modernising existing marginal farms, principally through new capital investment. As Fennell (1985) indicates, the emphasis has been on encouraging the use of additional capital through advice and capital grants—i.e. more spending on machinery, buildings and equipment. But this policy has favoured the better-placed farmers, those with the resources and motivation to take advantage of the schemes. It has also exacerbated the surpluses problem by raising output. Although an early retirement scheme was agreed, the modest payments on offer combined with rapidly diminishing job opportunities outside farming in the 1970s, meant that it has had a severely limited impact (Revell 1985). In the event, the utilised agricultural area in the Community has declined by 11 million hectares between 1966 and 1983, mainly due to urban growth and forestry. But the area down to crops has remained more or less constant overall, and has actually increased for some areas (sugar beet and common wheat). The area of woodland has grown at a faster rate

than even Mansholt envisaged, increasing by 15 per cent between 1966 and 1985, mainly due to systematic afforestation (CEC 1988).

The weakness of the Community's structural policy can be gauged from the limited resources devoted to it. In 1985 socio-structural (guidance) expenditure still only accounted for 5 per cent of total farm spending, falling well short of the Mansholt Plan's target of a 50 per cent share (see Figure 2.1). In fact, many commentators believe that even with a structural policy nearer to Mansholt's model, policy makers would have found it difficult to restructure production by voluntary means. Whether by choice or force of circumstances,

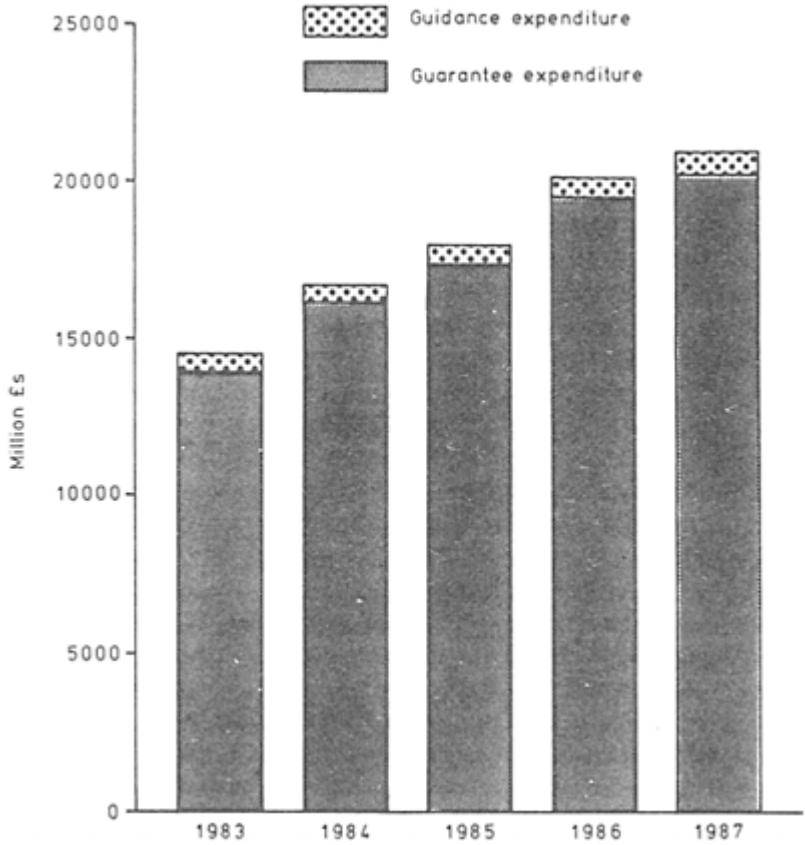

Figure 2.1 Guarantee and guidance expenditure under the CAP

farmers have remained remarkably immobile, though Tracy (1982) is ready to admit that 'conceived and implemented ten years earlier to benefit from a period of dynamic economic growth (which would have facilitated the transfer of people from the land) the plan might have succeeded'.

Since 1975, when the first in a series of special income aids to poor farmers and disadvantaged regions was ushered in with the Less Favoured Areas Directive (Council of Ministers 1975), the Community has moved further away from Mansholt's original vision. It is now an uncritically accepted part of the conventional wisdom that structural policy exists to keep farmers on the land 'for social and environmental reasons', not to remove them. More recently, the Integrated Mediterranean programmes have been pushed through to satisfy the concern of Southern member states about depopulation and rural decline. The depopulation of remote rural areas and the running down of agriculture is seen as an unacceptable policy outcome, particularly in France, where the fear of desertification far outstrips worries about the loss of habitat or landscape (Nowicki 1988).

Judging by recent pronouncements (Roelants du Vivier 1985), it seems unlikely that a true Mansholtian solution to the surpluses problem will emerge at this late stage. In its White Paper, the European Commission underlines the importance it attaches to maintaining people on the land, arguing strongly against a European agriculture on the model of the United States, with 'large reserves of land and few farmers' (CEC 1985a). The reasons for this policy are nowhere clearly articulated. Agriculture now no longer contributes very significantly to rural employment or to the maintenance of the rural economy in many member states. Sentimental attachment to the land and a reluctance to abandon it to the 'wild' seem in reality to be the main justification for the enormous public expenditure needed to implement this policy. Even in the UK, where the problem of depopulation and desertification is much less severe than in some other member states, it is an established view that farmers should be kept on the land. The government's Natural Resources Committee was voicing a heresy when, in 1966, it questioned "the justification for sustaining the sparse population eking out its precarious existence in uneconomical hill areas largely at the expense of the nation" (DES 1966:7). This question needs to be addressed in public debate. For now that supporting farmers in remote areas is not so easily justified by their role in maintaining rural communities, the management of landscape and habitat is being invoked as a new justification. According to this view, the countryside must be managed if it is to retain its conservation value. Whilst this is evidently true of many types of landscape and plagioclimax ecosystems, there are some areas where a Mansholt-inspired evacuation of remote or marginal areas could result in the creation of a 'man-made wild' with considerable intrinsic conservation value. Green (1977; 1985) has argued that the basic incompatibility of agriculture and conservation makes it more effective to segregate these land uses in this way. Withdrawing farmers from the remoter upland areas of the UK would result in a rich and unique wilderness for public enjoyment and scientific study, for it is no coincidence that

> some of the most beautiful and species-rich landscapes in Europe, the most important strongholds of golden eagles, peregrines, otters and wildcats, and the only areas in the UK worthy of designation as National Parks in the international sense are in the Highlands of Scotland which were systematically cleared of their agricultural settlements just over 150 years ago.
>
> (Green 1985:219)

In recent years supporters of this view have linked their programme even more explicitly to the thinking of 1968 by calling for a new Mansholt Plan, though this time one aimed at adjusting farm structures and the pattern of land use in ways which maximise environmental benefits rather than production efficiency. Such thinking is heavily influenced by the 'degrees of freedom' argument that was discussed in the previous chapter.

With the continued ageing of the farm population in upland areas and the high proportion without successors (put at between 25 and 50 per cent by Fennell in 1981), there may be scope for managing demographic change with something like this in mind, at least within restricted areas. According to the EC Structures Survey, some 37 per cent of UK farmers were aged over 55 in 1983, between them owning or managing some 4.7 million hectares of land (41 per cent of the utilised agricultural area). (Table 2.2 gives the breakdown for the EC.)

Given the rigours of a farming life in remote areas and the understandable reluctance of people today to endure such hardships, there could conceivably be a large-scale shake out of land as farmers without successors retire or give up farming. The nearest the Commission has come to recognising this potential and therefore approaching a Mansholt-style structural policy, is in the recently agreed pre-pension scheme which will, in certain member states, offer farmers in the 55–65 age bracket premium payments to abandon conventional farming on their holdings or give the holding up to a younger, first-degree successor (CEC 1988). Unfortunately, it may not be well enough resourced to have any appreciable impact on

Table 2.2 Distribution of farmers and area farmed, 1985

Age	*Size Class (%)*				*Total(%)*
	Less than 5 ha	*5–20 ha*	*20–50 ha*	*More than 50 ha*	
Less than 34	4.1	2.3	1.7	0.6	8.6
35–44	7.8	3.9	2.5	1.1	15.3
45–54	14.4	7.5	4.1	1.5	27.3
55–64	15.1	7.6	3.3	1.2	27.1
65+	15.9	4.3	1.1	0.4	21.8
Total	57.0	25.5	12.6	4.8	100.0

Source: CEC (1988)

restructuring and the transfer of farmers out of farming and it may favour plantation forestry rather than the natural regeneration of woodland which would be more environmentally desirable. The challenge held out by Mansholt has still to be taken up.

Market-led adjustment

If the planned withdrawal of farmers from the industry is untenable at the present time for a variety of political and cultural reasons, the idea of market-led adjustment can hardly be any more palatable. Nevertheless, groups like the monetarist Adam Smith Institute in the UK continue to argue that the market should dictate the speed and extent to which resources, including labour, are withdrawn from the industry (Adam Smith Institute 1983). The liberalisation of agricultural markets should begin immediately with the dismantling of price support under the CAP. Given the strength of present commitment to a basically protectionist CAP, such a radical step could hardly take place in the remaining decade of this century. But putting the political constraints to one side, the idea of allowing market clearing prices to determine the restructuring of agriculture is an interesting one, for it provides a benchmark against which other approaches can be measured.

A move to an open market for farm products would quickly set in motion the 'natural forces of readjustment' that have until now been held in check by market support (Coleman and Traill 1984). A very plausible scenario would be one in which the combination of falling output prices and plummeting land values would soon force many high-cost or otherwise vulnerable producers out of the industry, achieving a removal of farmers from the land similar to but less discriminating than the Mansholt Plan. Heavily indebted farmers would be particularly vulnerable to price pressure: something approaching 36 per cent of farmers in England and Wales had liabilities which exceeded assets in 1984 (MAFF 1985a). Even without this push, older farmers or younger farmers who had been trading at a loss might well decide to sell off their farms and live on the proceeds or, if they are tenants, take up a career elsewhere. Meanwhile, those who remained in business would be under pressure to expand their farmed area by buying up this released land. The eventual outcome would be a smaller industry composed of efficient, low-cost producers on the one hand, capable of remaining profitable while receiving world market prices for their products, and a rump of part-time, under-employed or hobby farmers on the other, the latter group comprising new entrants who would be taking advantage of the depressed farmland prices to buy themselves into hobby farming together with established farmers who 'get by' through diversifying their businesses and finding employment outside agriculture. This increasing polarisation would be accompanied by a general reduction of both hired labour and farm family labour (CAS 1986).

The land use repercussions of such a free market policy would be complex with transfers of land out of agriculture likely in some areas, but also a return to extensive farming in others. Clearly, this would be an unplanned and incidental process. Other things being equal, cereal producers would be likely to suffer the heaviest income losses, while pig and poultry farmers might actually find their position improved as lower grain prices filter through into lower input costs (Anderson and Tyers 1983). Body (1982) predicts improvements to the relative position of livestock producers and a large-scale transfer of land out of tillage and into grass and 'wildlife areas'. Few experts agree with Body's (1982) presumption that '[all] livestock farmers would gain immeasurably' in an

open market situation. They would, for instance, face stiff competition from imports of beef and dairy products. As Wibberley (1983) points out, withdrawing the largesse given to cereal producers is no solution to the problem of how to make small grassland farms viable in the late twentieth century. A research project sponsored by the Department of the Environment (DoE) investigating the countryside effects of CAP reform (CAS 1986), has made the prediction that an abandonment of agricultural support in favour of free trade would actually lead to an expansion in cereals acreage due to the proportionately greater squeeze on returns from livestock enterprises.

It is safe to predict, however, that there would be a concentration of arable production on the best land found on the lowest-cost and most efficient farms. These farmers would no doubt continue to benefit from new cost-reducing technological developments, particularly biological technical change in the form of improved seed varieties, better pest control and more efficient use of resources, raising productivity and output. In the UK the retreat from cereal production would probably be greatest on farms in what has become known as 'middle countryside'. Here, in the English Midlands and the South-west, farmers who had begun growing cereals on medium-quality land (see Table 2.3) would react just as promptly to a cost-price squeeze by abandoning their arable enterprises, returning the land to grass for livestock or planting it to trees. It is less clear whether these broad land-use changes would bring much environmental benefit. The conservation advantages of more mixed farming are well established (RSPB 1988). But the advantages of an expanded livestock sector are not, especially where this involves more intensive, concentrated production and more 'green deserts' in the

Table 2.3 Percentage increases in wheat and total cereal areas in the UK

Region	*Wheat*			*Total Cereals*		
	1953–73	*1974–80*	*1953–80*	*1953–73*	*1974–80*	*1953–80*
Eastern	1.5	1.5	1.7	1.6	0.6	1.2
South-eastern	1.1	3.2	1.9	0.9	1.0	0.9
East Midlands	1.6	5.2	2.2	2.3	2.3	1.8
West Midlands	0.6	2.8	1.5	1.8	0.8	1.6
South-western	1.2	3.1	2.1	0.7	0.7	0.7
Northern	0.0	3.0	1.1	0.8	1.1	1.1
United Kingdom	1.2	2.6	1.8	0.6	0.8	0.6

Source: Thomson and Neville-Rolfe, 1985:028

form of monocultural grassland. Any expansion of livestock production in the middle countryside would moreover have a 'shunting effect' (Agricultural Economic Development Commission 1987) as supplies glutted the market and pressurised existing livestock farmers, particularly in upland areas. Farmers in this latter group would then also need to make adjustments, some reducing costs by farming more extensively, others by searching for off-farm sources of income. Many would find themselves unable to

restructure their businesses quickly enough to survive, though much would depend on whether Less Favoured Areas support was continued or not. It is in these upland areas that the abandonment of price support (and, presumably, the dismantling of Less Favoured Area aids) would have the most dramatic land use effect and, according to one's view, the most dire social consequences. Land sold here by retiring or bankrupt farmers would probably be amalgamated with larger holdings to be 'ranched' or even abandoned. Alternatively, it could be purchased by forestry companies and planted. The land-use consequences would be more afforestation, and an increase in neglect, with more bracken and scrub. These trends would be decried by many conservationists, but might be welcomed by others as an outcome not far removed from the Mansholt strategy already discussed.

Some economists support a market-led approach to restructuring on the grounds that it would produce the most efficient application of resources within the industry. Each producer is able to respond to price pressure in the way most appropriate for him, while those who cannot or will not restructure do not survive. A market-led strategy is more likely than any other to reduce production costs and so maintain or improve competitiveness. And there would be some conservation benefits as land fell out of production and farming in some areas became more extensive. But there would also be a loss of conservation value as forestry expanded on the extensive margin and certain environmentally strategic farmers and their husbandry practices were forced out of existence. Policymakers would have fewer means at their disposal for managing or ameliorating any of the trends that emerge.

Combination solutions

The view of the Commission of the European Communities is that a market-led approach is untenable because of its probably catastrophic impact on farm incomes and the structure of European family farming.

> The complete abandonment of support for agriculture would be unacceptable on economic, social and political grounds. It would also run counter to the objectives for agriculture set out in Article 39 of the Treaty of Rome and would undermine the whole basis of the CAP.
>
> (quoted in House of Lords 1984:5)

In practice, a less elegant, but more pragmatic, combination of both state—and market-led adjustment has already been adopted by European farm ministers following the Fontainebleau summit of 1984. Moderate but sustained price cuts for cereals and the continued use of quotas in the dairy sector are now underpinning more direct selective action in restructuring production and supporting vulnerable farmers. The aim is to achieve a gradual and managed adjustment of the agricultural industry, giving sufficient time and resources for farmers in the production sector to be able to adjust to new market realities without going out of business in the process. Consistent price pressure, applied over a number of years, will trigger many of those changes but a revivified set of socio-structural policies is also now being introduced to speed them up. With the emphasis

firmly on the restructuring of existing business through extensification, conversion and diversification, this is an approach which seeks to keep farm structures more or less intact. The new socio-structural measures, emphasising restructuring within farms and the support of vulnerable and disadvantaged farmers, add up to a 'farm survival policy' based on a still very firm commitment to maintaining farmers on the land, at least over large stretches of the Community's agricultural area (CEC 1988). The bare bones of this strategy are:

1 gradually to reduce production in the sectors which are in surplus and to alleviate the resulting burden on the taxpayer;
2 to increase diversity and improve the quality of production;
3 to deal more effectively and systematically with the income problems of small family farms;
4 to support agriculture in areas where it is essential for land use planning, maintaining the social balance and protecting the environment; and
5 to develop industries which process agricultural produce and thus ensure that agriculture remains in the mainstream of technological progress.

These are unexceptionable as they stand. The danger is that in their anxiety to achieve the limited objective of solving the budgetary crisis, the first priority on this list, policy-makers will fail to plan for the redeployment of agricultural resources which the existence of surpluses now makes possible. Fennell (1985:274) comments that

> because the over-riding concern [is with] budgetary costs, attempts to modify the CAP have concentrated on adjustments to the machinery through which it operates and have not dealt with fundamentals.

The agreement by farm ministers in 1988 to a system of 'budgetary stabilisers' (CEC 1988) puts in place the first component of a combination strategy. Their use suggests that price is to play a leading role in this strategy—though not quite in the determinedly rigorous way that many free marketeers would like. The stabilisers will ensure that cereal prices are cut by a given amount whenever production at the end of harvest year exceeds the fixed Community threshold of 130 million tonnes. Production up to that threshold will receive price support in the usual way. The hope is that a degree of control will automatically replace the drawn-out and inconclusive haggling which would otherwise attend any proposal to cut the guarantees which European farmers receive. Taken together with the international pressures for reduced agricultural protection which are now crystallising in the current round of the General Agreement on Trade and Tariffs (GATT) negotiations, arable farmers now appear to be faced with steady and ineluctable declines in product prices. At the same time, the quota system which has applied to milk production since 1984 looks set to remain in place, offering little scope for dairy expansion and yet providing some security to those who remain in business (Harvey 1986). Subsidies on beef production are also on a downward trend following the 1984 agreement to cut beef variable premiums.

To be effective in containing the cereal surplus, the price cuts that will be triggered under the stabiliser system must make it progressively less profitable for a farmer to increase output at the margin, taking account of the additional costs of any increase. In

theory they should induce farmers to transfer land out of a surplus crop and into some alternative crop, enterprise or use that does not add to the surplus. Alternatively, price pressure may encourage him to farm the same crops less intensively by cutting his use of fertilisers, pesticides and sprays. Compared to the draconian effects of an open market approach, which solves over-production by removing farmers and their capital from the industry, the modus operandi of measured price reductions is gentler and more paced. Most of the adjustment takes place at the level of farms rather than at the level of the industry. The first result will be to push more and more farmers into a cost price-squeeze, starting with the high-cost producers. Unless the squeeze is very tight, most will manage to remain in business, making their own adjustments by diversifying, switching enterprises or simply learning to live on a reduced income.

Taken in isolation, then, moderate price reductions will probably produce fewer of the dramatic transfers of land and farmers which might be expected in a completely open unprotected market or as a result of an enforced restructuring of production by governments. Nonetheless, land use changes will occur as some farmers introduce new alternative enterprises (CAS 1986) and make determined efforts to cut costs. The conservation balance sheet of these adjustments, some positive others negative, is a complicated one. An absence of empirical research means that it has still not been assessed, though work is proceeding (CAS 1986). The general feeling is that while reduced price support would in principle produce some benefits (Bowers and Cheshire 1983), these could be cancelled out once the adjustment process was underway (Baldock 1984; Potter 1986). The precise environmental effects of lowering price support are difficult to predict. As with market-led adjustment, the most marked shifts in land use will probably be experienced in the middle countryside. If anything, the significance of middle countryside could be more marked under this approach compared to market-led adjustment. In this situation, it is likely that hill farmers will continue to be sheltered by the LFA policy, though they will still suffer from the shunting of livestock production from the lowlands. Once again, efficient producers in the arable heartland will succeed in remaining profitable and may need to make only small adjustments. Hence, it is in middle countryside that most of the adjustments will have to be made. It is here that most land will probably be transferred from cereals to grass, and in suitable areas, where most diversification will occur, particularly on farms close to towns and in scenic locations (Slee 1987).

At farm level, price pressure is already encouraging farmers to be more careful and economical in their use of farm sprays and other purchased inputs. On the extensive margin, reduced profitability and a lower projected return on investment in land improvement is putting a brake on the rate at which farmers drain, clear and reclaim marginal land and habitat. By the same token, however, there are signs that farmers are becoming less willing and able to invest in conservation on their farms (not an important negative, some would say, given the lesser conservation value of planted trees compared to ancient woodland or of farm ponds compared to wetland habitat). The laying-off of farm workers in future by beleaguered larger farmers might also make it more difficult for farmers to carry out many of the things that conservationists are campaigning for: integrated pest management, improved pollution control and basic habitat management all require large inputs of skilled labour (Raymond 1984). Consequently, although the rate of habitat loss through land improvement will undoubtedly slow down, it may be that

the countryside and its habitat will become progressively less well managed. Many would agree with Baldock (1984:44) ‘that price changes alone are too coarse an instrument to achieve specific environmental goals, especially when applied on a Community scale.’

The social effects of lowered market support and tighter quotas are also difficult to predict. Farmers are likely to first economise on that most expensive input—farm labour. Full-time jobs are expected to be more vulnerable than part-time or casual ones (Errington 1987). Beyond the farm gate, the same economies in the use of bought inputs which may benefit the environment of already husbanded land, together with less investment in farm machinery and equipment, will also affect the downstream industries of agricultural suppliers, causing them to lay off workers, often in rural localities. Less production will also squeeze the industries upstream which process and distribute food. The evidence from the imposition of milk quotas is that both ‘down stream’ and ‘upstream’ industries suffer once agriculture begins to tighten its belt (see Table 2.4). According to Lowe and Winter (1987), it was workers in these industries rather than the farmers and their workers who bore the brunt of this policy measure.

A farm survival policy

But price pressure is only one of the elements in a combination approach. The Commission’s Green Paper (CEC 1985a) which first

Table 2.4 Projected employment effects of CAP reform

Policy Scenario	*Farm Level (whole time equivalents)*	*Total**
Quotas	−12,585	−57,457
Price Restraint	−10,254	−39,503

*Includes upstream and downstream job losses associated with agricultural adjustment
Source: CAS (1986:110)

proposed the idea of ‘managed adjustment’, envisaged a linked reform of market and structural policies, recognising that any move towards a low price regime would have to be accompanied by direct income aids and by measures to speed up the restructuring process. This is all part of the attempt to uncouple the market clearing from the income support roles of the price mechanism. The general view is that ‘if selective measures are provided and finance made available from the savings on support, the CAP can be operated more responsively than hitherto’ (House of Lords 1985). There is a strong feeling amongst environmentalists that an appropriately tailored set of structural measures, operating alongside price pressure, offers the best hope of ensuring that the CAP can be made more environmentally sensitive. According to one authority, ‘cuts in CAP prices [are] probably one desirable element of reform’, but only if ‘these could be implemented in parallel with much needed changes in structural policy, designed to protect farm incomes in a different way, rewarding environmental management as well as production’ (Haig and Grove-White 1985:7).

Structural policy has the advantage of selectivity, whether of farmer groups or spatial coverage. It is far less blunt and broadbrush than the price instrument. Against this, the resources at its command are far smaller compared to spending on price guarantees (Figure 2.1). Moreover, as Barbero and Croci-Angleine (1984) point out, there are certain basic differences between the decision making structures of market and structural policy under the CAP which work to the advantage of the former. It has always been easier to work up a consensus for the level of price guarantees (at least when they were being increased) than to reach agreement about a common policy for agricultural restructuring. Price policy affects all producers and, once agreed, can be implemented more or less autonomously. Structural policies, by contrast, must discriminate if they are to succeed, between either types of farms, or areas.

Certainly it is true that most of the environmental opportunities offered by CAP reform are located within socio-structural rather than market policy, which is why its continuing evolution into a 'farm survival policy' is such an important development. As seen above (p. 19) socio-structural policy has arguably been tending this way ever since 1985 when the Less Favoured Areas Directive (Council of Ministers 1975) ushered in the first in a series of direct income aids to disadvantaged regions and upheld the principle, quite counter to Mansholtian logic, that farmers should actually be maintained on the land for social and environmental reasons. The price pressure placed on vulnerable farmers by market reforms, together with the particular structural implications of Iberian accession, have merely made this aspect more explicit. There is now a very clear presumption that socio-structural policy has a perfectly legitimate role to play as a safety net which, provided it is properly positioned, will gather up disadvantaged farmers who are least equipped to adjust to the new market conditions. Structural aid will be used to ensure the survival of farmers, but it will be used selectively and will require something from farmers in return. So, farmers who live and work in hostile physical environments, poorly developed rural economies or where there are persuasive environmental reasons why they should stay in business, are already being targeted for a range of measures. The Less Favoured Areas policy is being renewed and extended, a new Environmentally Sensitive Areas programme has been introduced and proposals have been tabled for a set of direct income aid schemes.

As well as giving direct support to certain vulnerable groups, guidance funds are also now being used to speed up the restructuring of production within farms which manage to remain in the production sector, chiefly through extensification, conversion and diversification. The Extensification Regulation for instance aims to 'achieve quickly reductions in production that would otherwise be secured only as a result of price pressure over a number of years' while at the same time 'helping farmers to adjust to the changed market circumstances and requirements' (House of Lords 1988:6). Nationally funded schemes like the Farm Diversification Scheme in the UK further this end by encouraging farmers to diversify their farm enterprises and hence reduce their dependence on supported crops. Gasson (1988) points out that this scheme, and other enabling initiatives like it, promote an idea of restructuring which begins and ends with the farm itself.

The implications of all this for conservation are profound. Some will regard a farm survival policy as a constraint because, by preserving farm structures, it limits the scope for redeploying land and capital in ways which could increase diversity and interest in the

countryside. A farm survival policy does appear to rule out a new Mansholt Plan. On the other hand, it also means that increasing numbers of farmers will be required to extensify production or divert land on their farms by entering into government schemes. Further ahead, and most significant of all, it also implies the creation of a new state-supported sector of farmers, for whom countryside management is a main rather than a subsidiary activity. Such farmers will find that environmental protection defines a range of activities for which they can receive a state payment; income aids will be available but those who receive them are expected to become private producers of public goods in return. The challenge for conservationists is to ensure that the terms of this exchange are defined in ways which maximise the environmental benefits that farmers have to deliver in return for such payments.

Conclusion

This chapter has considered three alternative approaches to agricultural adjustment, two of them hypothetical, the other already being followed by European policymakers. A Mansholt-inspired withdrawal of farmers and their landed capital from the industry remains a remote possibility, given prevailing political and cultural constraints. It offers a dramatic but unrealistic solution to the long-term problem of over-capacity in agriculture. Market-led adjustment is equally implausible, if only because of the severe social dislocation and economic hardship which would accompany it. In practice, policy-makers have opted for the idea of managed change, in which price pressure will be used to bring about a rationalisation of enterprises and a diversification of land use at farm level, but without necessarily requiring the removal of the farmer himself. Specific measures are to be used to speed up some of the farm-level adjustments, typically involving extensification and the setting aside of land, and some farmers will receive direct support to allow them to continue in farming. This farm survival policy sets severe constraints on the scale at which land and other resources can be withdrawn from agriculture and put into alternative conservation and recreational uses. Yet, realistically, it establishes the framework within which any extensification of production or diversion of land will be carried out. The next chapter considers in more detail how such a farm survival policy might be arranged to benefit conservation more directly than it has so far.

Chapter three
Managing change

The offering of income aids to disadvantaged or otherwise beleaguered groups of farmers who, in return, agree to make their farming practices more environmentally sensitive, is probably the most direct and powerful way in which a farm survival policy can be arranged to benefit conservation. Von Meyer (1985) has canvassed the idea of 'direct environmental remuneration' where farmers are paid by the state to produce CARE goods. Whitby and Harvey (1988) characterise this as a means whereby agriculture departments can purchase a part of a farmer's right to property through a management agreement, in this case the 'right' to reclaim land or intensify production. One of the best practical illustrations of this concept is the Environmentally Sensitive Areas (ESA) programme, which was agreed by farm ministers as part of a package of socio-structural measures in 1987 (CEC 1985b).

The great importance of the ESA programme is that it is an example of a socio-structural policy being used to keep farms on the land for well-defined environmental rather than simply social or production reasons. As such it illustrates very well the idea of a new type of exchange between farmers and the state, in which the state selectively purchases rights to increase production or even to reduce production. There are now twelve designated ESAs in England and Wales covering some 333,000 hectares of land (see Figure 3.1, p. 34) (MAFF 1989b). Farmers within these areas are eligible under the 1986 Agriculture Act for hectarage payments in return for entering into agreements which limit their ability to intensify production and carry out damaging land use changes. The ESAs themselves are typically places where traditional husbandry practices must be continued if the characteristic landscape and ecology is to be conserved. According to the CEC they must be areas where 'the maintenance or adoption of particular agricultural methods is likely to facilitate [the] conservation, enhancement or protection of the nature conservation, amenity or archaeological or historic interest of an area' (CEC 1985b:2). Farmers within ESAs are typically traditional livestock producers. ESA payments enable them to continue farming in the time-honoured and 'environmentally friendly' manner. The idea is that they enter into management agreements with agriculture departments, receiving payment in return for an undertaking not to depart from suitable husbandry practices. In some ESAs additional payments are available to farmers who enhance the conservation value of their land by carrying out various approved practices, including the conversion of land from arable to grass. The Ministry of Agriculture, Fisheries and Food (MAFF 1988a) reports encouragingly high levels of participation amongst eligible

farmers, with 90 per cent of eligible land having been placed in the programme. All comprise areas that depend on a continuation of traditional farming for the conservation of their characteristic landscape or ecology, whether through the burning of moorland in the Cambrian Mountains or the grazing of heathland in West Penwith. Table 3.1 summarises some of the features of ESAs and the threats which designation is meant to avoid.

The significance of ESAs is twofold (Potter 1988). First, they signal a recognition that some tracts of countryside can only be effectively conserved by maintaining the traditional systems and styles of farming which have created them. In other words, it may be necessary to ensure the survival of certain farm businesses in some areas if conservation goals are to be met. Secondly, the ESA programme in the UK is being funded as an agricultural policy scheme rather than as an environmental one. Farm support money is for the first time being used to maintain 'environmentally strategic farmers'. Socio-structural and environmental policy objectives have been woven together around the idea that it is legitimate and desirable to maintain the 'particular character' of farming in a lowland (rather than merely upland) area. The programme forges a link between maintaining farmers' incomes and achieving conservation goals, for it encapsulates the important idea that farmers should receive state aid to 'produce countryside'.

What is being developed here is the novel but potent idea of 'contract conservation'. This is on offer to farmers who, until now, have usually been bypassed by conservation subsidies. These laggards in the modernisation process suddenly find themselves qualifying for conservation subsidies precisely because of their past inability or disinclination to intensify land use.

ESAs are very much a British invention, conceived and promoted by MAFF but actually enshrined in the 1984 Structures Regulations and thus an essential part of the new socio-structural policy. From the perspective of other member states, such as France and West Germany, it is the income support role which looms larger than the environmental purpose of ESAs. Realising the full potential of ESAs as a European programme will depend on the attitudes of countries like these, more preoccupied with maintaining a widely spread population to prevent rural desertification than with defusing conflicts between agriculture and the environment as such.

ESAs, then, demonstrate quite convincingly that conservation interests can be furthered within the framework of a farm survival policy. But can the same be said about the proposed direct income aid schemes that are a more recognisable feature of this approach? The basis for a system of Community and national aid schemes to certain disadvantaged farmer groups was first discussed in the Commission's Green Paper. More recently a set of proposals has appeared in a draft regulation issued in June 1987 (CEC 1987b). A single Community-funded but voluntary scheme is now under discussion which aims to assist intermediate farmers in making adjustments to the new market conditions. These are essentially farmers whom the Commission regards as being potentially viable in the long term but who may be having difficulties in restructuring

Table 3.1 Landscape, habitat and farms targeted by ESAs in England

ESA	*Total area (ha)*	*Landscape characteristics*	*Habitats*	*Target farms/ farming systems*
Breckland	94,032	Broad and open heathland landscape with distinctive shelterbelts of Scots pine; river valley landscapes	Grazed heath; calcareous grassland; wet grazing meadows	Remaining livestock farms in river valleys; arable farms with characteristic landscape features
Broads	32,160	Open, homogeneous grazing marsh landscape; flat valleys and fen and fen carr	Marshland; dykes; fen/carr woodland	Traditional livestock farms and graziers
North Peak	50,250	Wild moorland plateaux indented by deep valleys	Peat moorland; oak woods; haymeadows	Hill sheep farms on high moors and surrounding valleys
Pennine Dales	15,600	Characteristic limestone scenery of grassland and valley bottom meadows, drystone walls and field barns	Wet pasture, haymeadows and woodland	Hill sheep farms and some sheep and cattle farms (for stores)
Somerset Levels and Moors	26,970	Flat landscape criss-crossed by rivers, ditches and rhines	Wetland	Traditional dairy farms and mixed farms combining dairy, beef and sheep
South Downs	54,343	Chalk grassland landscape with scattered trees and shrubs	Species rich chalk grassland; river valley mosaic of fields, ditches and dykes	Traditional downland farms plus mixed farms
Suffolk River Valleys	32,149	Pastoral landscape of river valleys with grassland, hedges and reedbeds	Wet grasslands, reedbeds, rivers and ditches	Mixed farms with livestock on river valley grassland
Test Valley	2,690	Pastoral mosaic of river, trees, carr, reedbed and pasture	Chalk stream communities and chalk grassland	Mixed farms
Shropshire borders	21,000	Characteristic, intricate pastoral landscape of small fields and unimproved pasture	Rough grazing, valley woodlands and hedgerows	Cattle and sheep farms
West Penrith	7,210	Rugged coastline, moors, small fields	Coastal to inland heathland; scrub and wetland	Traditional dairy farms

Source: MAFF, various

quickly enough in order to remain in business. Meanwhile, the Council has already agreed to set up a new pre-pension scheme targeted at farmers aged 55 or over (CEC 1988). In principle there is no reason why any of these measures, like the ESA programme, should not contain an element of contract conservation. The pre-pension scheme is a potentially very useful conservation tool for it requires participating farmers to abandon conventional farming on their holdings, retiring from agriculture and putting the land into a non-agricultural use 'compatible with preserving the quality of the environment'. The drawback of this and all other direct income aid schemes is that to be effective they must be aimed at identified farmer groups, not at land. The farmers who take up these measures are unlikely to be distributed in a way which coincides with areas of greatest environmental need or potential. Income support and environmental protection become conflicting rather than complementary policy objectives. This point is underlined by a House of Lords select committee who make a plea for 'a clear distinction [to] be made between income aids favouring systems which the taxpayer wants for environmental reasons and those aids which are introduced to alleviate hardship in individual cases' (House of Lords 1985:33).

Extensification or set-aside?

Measures to speed up the restructuring of production and encourage particular changes in the pattern and intensity of land use on farms are arguably also a part of the farm survival policy because they encourage the assumption that restructuring is something that can be carried out by individual farmers as part of a survival strategy. If farm ministers appear to have rejected the idea of applying an accelerator to the movement of farmers out of the industry (CEC 1988), they are much more committed to using structural measures to accelerate the extensification of production and the diversion of land within farms. Once again, agricultural departments are purchasing rights to intensify or increase production, with farmers agreeing to divert land or extensify production in return for a payment. Next to the ESA programme, this simple idea offers some of the greatest opportunities for managing farming change in environmentally sensitive ways.

Extensification first entered the vocabulary of agriculture ministers following the agreement to an extensification scheme at the Brussels summit of 1988. This scheme aims to 'achieve quickly reductions in production that would otherwise be secured only as a result of price pressure over a number of years' while at the same time 'helping farmers to adjust to the changed market circumstances and requirements' (House of Lords 1988:6). Under the regulation member states are required to devise and offer farmers schemes to extensify the production of cereals, beef, veal and wine. Target reductions in output of at least 20 per cent are to be achieved in return for compensation payments. But what is meant by extensification? Conservationists, especially in the UK, were quick to interpret extensification as the adoption of environmentally friendly farming systems, seeing it as a mechanism for enhancing the conservation value of large areas of countryside. There was the prospect of more extensified livestock farming for instance, with more emphasis on the conservation of grass as hay rather than silage. This would mean fewer fertilisers and pesticides (given that silage is a much more intensively

grown crop), reduced pollution from silage run-off and safer nesting habitats for many ground-nesting birds. For cereal growers there would be the opportunity to convert to low-input or even organic systems of farming.

In practice, agriculture departments favoured a much narrower interpretation. As North (1988) points out, extensification has typically been defined at the Community and farm level rather than at the level of individual fields. At the field level, extensification would involve a reduction in the number and extent of inputs in the production system; at the Community or farm level it may simply involve reducing the area of intensively farmed land. Hence, instead of achieving a 20 per cent reduction in output, a farmer may merely be required to reduce his total cereal area or number of beef cattle by 20 per cent. In the case of cereals, what was extensification becomes set aside. While it is true that withdrawing land from production may indeed result in less output per hectare of the total land area, this is extensification in only a relatively trivial, statistical sense (Harvey and Whitby 1988).

In the UK, MAFF moved rapidly to implement its own set-aside scheme, to the chagrin of many conservationists. From 1988 farmers have been offered up to 200 per hectare to remove at least 20 per cent of their cereal land from production over five years. The land may be fallowed on a rotational basis, planted to trees or diverted into some non-agricultural use such as building (MAFF 1985a). Table 3.2 indicates how the rates of payment on offer are varied according to which of these options a farmer decides to take. At the time of writing, some 60,000 hectares of arable land have been enrolled for the harvest year 1987/88 at a cost of £11 million. Of this cost, 42 per cent will be reimbursed from EC funds. Three quarters of the land set aside in this first year has been fallowed and a mere 2 per cent planted to trees.

After the early promise of a regulation on extensification, many environmental groups have greeted the set-aside scheme with undisguised disappointment. Most appear to agree with Bowers' (1988) assessment of the scheme as 'essentially an agricultural policy expedient' with only incidental environmental benefits. The emphasis appears to be on reducing the output of surplus farm products rather than increasing the production of CARE goods. Most of the land already set aside is being put into short-term, rotational fallows. Bare fallow was ruled out at an early stage for fear

Table 3.2 Set-aside payments available in the United Kingdom

Alternative use	*Non-LFA Land (£/ha)*	*LFA Land (£/ha)*
Permanent fallow	200	180
Rotational fallow	180	160
Woodland—under extensification scheme only	200	180
—under farm woodland scheme	190	150*
		100†
Non-agricultural use	150	130

Notes: *Disadvantaged areas
†Severely disadvantaged areas

Source: MAFF (1988b)

that this would exacerbate leaching of nitrates and soil erosion in some localities. Yet as the RSPB (1988) point out, even a rotational fallow planted with a cover crop is much less useful than a permanent or semi-permanent fallow which, given time, would develop naturally into rough grassland and eventually scrub and woodland. Another disappointment is MAFF's decision not to allow grazing of grassland fallows on the grounds that any increase in sheep and beef production (particularly the rearing of fat lambs) will rebound on more vulnerable upland livestock producers by glutting markets and forcing down market prices. But grazed fallows are inherently more environmentally valuable than other types. At a minimum, reintroducing grassland on to specialist cereal farms could pave the way for more mixed farming in areas where specialisation has sharply degraded landscapes and habitats. More ambitiously, farmers could be encouraged to restore or recreate heathland and grassland habitat on land taken out of arable production. These options are ruled out by the narrowly focused nature of the scheme. Meanwhile, there is a widely expressed suspicion that, despite safeguards, there will be some 'knock-on intensification' on participating farms as farmers enrol the regulation 20 per cent and then proceed to apply more fertilisers, sprays and other capital inputs to the land which remains in production in an effort to make up the difference. A related danger is that, despite having to prepare a farm plan before joining the scheme, some farmers will still find a way to bring 'new land' into production by reclaiming roughland or ploughing grassland.

The question of where in the country land will be set aside has become a particular bone of contention. Targeting is seen to hold the key to making set-aside more environmentally sensitive because by reducing the population of eligible producers it would enable agriculture departments to offer higher rates of payment than would otherwise be the case. These could be used to reward more restrictive but environmentally beneficial alternative uses of the land. Few believe that under a scheme which is open to all farmers, no matter where they farm, land will be set aside in the best locations to maximise environmental benefits. MAFF has shied away from imposing any geographical restrictions on participation in the belief that this would discriminate unfairly against farmers in 'non-target' areas. Yet, by operating the scheme in this way, the authorities have no way of steering set-aside into areas or on to farms where it can be most cost effective or environmentally beneficial. Participation will be geographically uneven (both within and between member states, and by type of holding), reflecting the willingness and ability of farmers to take up the scheme. Bowler (1987) argues, for instance, that uptake will be strongly influenced by the availability of a viable, alternative land use in an area. From an analysis of census data at county level, he concludes that counties showing a high rate of increase in the number of cereal farms in the period 1976–85 will have a competitive disadvantage compared to core cereal-growing areas. Uptake will be highest in these more peripheral cereal areas. Harvey and Whitby (1988) discriminate between those who can afford to take up the scheme and those who cannot afford not to. They predict that the early participants will be individuals with insufficient capital or labour for their present farmed area (see Chapter 7).

Conservationists have argued for set-aside to be targeted. The RSPB (1988) believe that set-aside should be directed away from areas which have diverse cropping patterns,

where there are mixed crop and livestock enterprises and where the area under cereals forms only a small proportion of the whole. Targeting producers in the Midlands, North and West of England, for instance, could reduce the hectarage of spring cereals compared to winter cereals, given the preponderance of the former in wetter conditions. Yet growing spring cereals increases the area of bare ground for ground-nesting birds such as lapwing and provides a good habitat for first broods; winter cereals have generally grown too tall by the spring to be as accommodating. By comparison, considerable landscape and wildlife benefits could be produced by targeting specialised cropping farms located in the predominantly arable South and East. Setting aside land in these areas and reintroducing grassland on to such farms could do something towards redressing the damaging polarisation between areas dominated by arable production in the South and East and livestock-dominated areas elsewhere. There appears to be an increasing recognition that it could prove a powerful mechanism in the environmentally sensitive management of adjustment on farms.

Set-aside or land diversion?

Conservationists evidently no longer dismiss the idea of land diversion out of hand. The shortcomings of the existing scheme appear to have underlined what could be achieved with a properly designed programme. Instead, there is justifiable concern at MAFF's very narrow interpretation in the context of the new set-aside scheme, where the temporary withdrawal of land is being justified in strictly agricultural supply-control terms. The priority here is to speed up the diversion of land out of the production of surplus crops, not to promote some alternative pattern of land use that might be deemed to be in society's long-term interest. Recent suggestions that the voluntary scheme may be the precursor to something much bigger, with large-scale, compulsory set-aside being implemented as an instrument for production control, have raised fears concerning the land-use impact of 'acreage reduction' (House of Lords, 1988). 'Set-aside', so defined, has consequently come to symbolise for some conservationists the way in which the reform of the CAP is being mismanaged and directed away from wider social and environmental goals. According to Baldock and Conder (1987), set-aside is a clear step backwards in recent tentative moves towards an environmentally sensitive CAP. Its rapid and uncritical adoption by policy-makers connotes a failure to appreciate the enormous social and environmental significance of a large-scale set-aside policy. It calls into question the ability of agricultural policy-makers to move towards an integrated approach in which the needs of rural communities and the environment are given equal consideration.

To be precise, the idea of land diversion—in which farmers would be paid by the State to divert the land into socially approved uses—has been eclipsed by a simpler and cruder notion of set-aside, in which land is removed from production for short periods to help bring about market balance. For Lowe and Winter (1987) the ascendancy of set-aside can be explained by the power of the farm lobby in redefining (and so misconstruing) the terms of the land-use debate. Rather than agree measures which will bring about the restructuring of farms and the redeployment of capital, farm ministers have apparently been persuaded to focus on searching for new uses for 'surplus' agricultural land. Set-

aside naturally appealed to farmers' representatives who feared the effects of price cuts and recognised in set-aside an attractive alternative. Thus, in 1986, the National Farmers' Union (NFU) unveiled its proposal for a flexiquota system whereby all farmers would be required to fallow an agreed proportion of their cereal hectarage each year as a pre-condition for an agreement on price support (NFU 1986). The flexi-quota scheme, seen largely as an expedient measure (a way of buying time until longer-term adjustments could be made) was promoted as a comfortable alternative to price cuts and their attendant 'dramatic effects on the countryside' (NFU 1986). But the EC had already considered and rejected such expedients, pointing in its Green Paper to the unhappy American experience with large-scale acreage reduction. In an economic analysis, Buckwell (1986) suggests that an acreage reduction programme which is large enough to reduce surpluses would be horrendously bureaucratic and expensive. Obtaining agreement at a European level would be no easy matter.

In the UK, MAFF had conducted its own assessment of large-scale, compulsory set-aside. An internal memorandum considered different approaches, giving short shrift to the idea that set-aside could ever be a viable or politically acceptable alternative to price restraint. Having recently introduced quotas on milk production, the government could not lightly advocate extending the same bureaucratic principle to another large area of agricultural output. The drawbacks of set-aside would be similar to those associated with quotas: if introduced, it would increase inefficiency by freezing production in its present pattern. It would also fatally weaken the resolve of farm ministers to agree price cuts and might even be used to justify price increases. Meanwhile, steadily increasing yields on the land which remained in production under set-aside would soon wipe out any savings that had been made, unless progressively more and more land is set aside each year. In short, the cure is worse than the disease (MAFF 1985a).

Set-aside nevertheless soon resurfaced as one component in a package of measures when MAFF's voluntary scheme was agreed in 1988, albeit under cover of the extensification scheme. It is a testimony to the power of producer interest groups in the European Community that, despite its manifest drawbacks as a policy instrument, set-aside should now be firmly established as a feature of agricultural policy.

There is a wide gap between the set-aside schemes now in favour throughout the Community and the land diversion programmes that are desirable on environmental grounds. Nevertheless, there are some faintly encouraging signs. MAFF now maintains that 'a major element of the set-aside scheme is the payment to farmers to continue to manage set-aside land in a way that will be attractive and beneficial to the community at large' (MAFF 1988b). The Department of the Environment (DoE) has now provided money for additional top-up payments to be made available to farmers who agree to carry out specialised conservation tasks over and above the standard requirements of the scheme. The Countryside Premium Scheme is administered by the Countryside Commission and is presently available to farmers in parts of East Anglia and the Midlands (Table 3.3).

Such farmers are being encouraged to make set-aside land available for informal recreation and to improve the rights-of-way network by retiring land along existing footpaths and bridleways and by creating new permissive rights of way, along the edges of fields for instance. Farmers who agree to enhance the conservation value of their grassland fallows through natural regeneration and the use of appropriate grass mixtures

are also being rewarded by receiving these top-up payments. Putting these small concessions to one side however, there are limits to what can be achieved, given the narrow and severely agricultural emphasis of the original scheme. The

Table 3.3 The Countryside Premium Scheme

Option	*Objectives of management*	*Payment (£ per ha)*
Wooded margins	To manage existing hedgerows to improve or create habitats for wildlife. To create new hedgerows and belts of broad-leaved trees and shrubs.	85
Meadowland	To create new areas of grassland for the benefit of wildlife and for quiet countryside enjoyment of the local community.	120
Wildlife fallow	To create habitat attractive to ground-nesting birds and encourage the growth of wildflowers on arable land.	45
Brent geese pasture	To create winter grazing for brent geese in selected areas as a means of minimising grazing damage to winter cereal crops, etc.	90
Habitat restoration	To restore certain valuable wildlife habitats.	Varies

Source: Countryside Commission (1989)

absence of targeting exemplifies this, for here is a missed opportunity to manage the retirement of land in ways which will benefit conservation and recreation.

What is needed is a much more ambitious and imaginative land diversion programme which is firmly directed towards conservation objectives. A strong case can be made for going back to the drawing board to design this afresh. Support for such an approach is given in the European Commission's *A Future of Rural Society* paper, which proposes a systematic network of special protection zones created by diverting at least 10 per cent of the Community's farmed area (CEC 1988). An appropriate model can be found in the Conservation Reserve Programme that was recently set up in the United States under the conservation title of the 1986 Food Security Act. According to Ervin (1987:62), the Conservation Reserve 'has been conceived as a way of exchanging compensation payments for non-market conservation benefits in a period of adjustment', a definition which ties in nicely with the general concept of a European farm survival policy. Later chapters will explore how far the setting up of a British Conservation Reserve could contribute to the reconstruction of landscapes and habitats in the countryside. But first we must examine the US Conservation Reserve itself to see if it offers any lessons in the long-term diversion of land.

Conclusion

A farm survival policy evidently offers some genuine opportunities for conservation at a time when the level of support through price guarantees is on the decline. That some groups of farmers will find that they can only remain in business by producing CARE

goods under government contract is an intriguing prospect, though much depends on how well the conservation contracts themselves can be made to work in practice. The ESA programme sets an encouraging precedent. Equally, the offering of extensification and set-aside payments to farmers who remain in the production sector, a complementary feature of the new policy, is a useful innovation. At present, though, set-aside means that widely scattered parcels of land are being taken out of production for too short a period to be environmentally beneficial. There is a need for new thinking on how a programme of long-term land diversion might be designed to produce the new landscapes that were evoked so memorably by Fairbrother.

Chapter four
Learning from another country

To understand how and why it came into existence, the Conservation Reserve Programme needs to be placed in the wider context of recent changes in US agricultural policy. Few countries can be so experienced in the diversion of farmland as the United States. Since the 1930s, vast areas have been taken out of agriculture, not only to reduce over-production but also to ease many of the environmental problems associated with continuous, intensive farming. North American agriculture suffers, like its European counterpart, from chronic over-capacity. The history of US farm policy is of a series of attempts to reduce supply or open up new markets abroad in order to stabilise farm prices and incomes. Large-scale acreage reduction took place for the first time in the 1930s when the Agricultural Adjustment Act of 1933 empowered the federal government to pay farmers to reduce their acreage of certain surplus crops (chiefly corn and cotton). Each farmer was assigned an allotment which specified the acreage of land that was eligible for land retirement payments in any one year. The allotment level was adjusted after each harvest to take account of market changes so that the set-aside policy, as it came to be known, operated year by year to reduce market imbalances and prevent fluctuations in commodity prices. This simple, indeed crude, idea of temporarily withdrawing land to equilibrate agricultural markets was to be the basis of much larger acreage reduction or set-aside programmes later on, geared to reducing excess production over short periods. Many of the inefficiencies and drawbacks of set-aside were prefigured in this first programme (Brandow 1977). It was found for instance that farmers had a tendency to expand their production of crops that were not qualified for allotments, increasing the revenue from these crops as well as receiving the set-aside payments. As uncontrolled crops flooded onto the market, consumers and users often switched to buy more of them at the expense of the more highly priced controlled crops, a propensity which only exacerbated the surplus problem by reducing demand for controlled crops still further.

It was at about this time that the foundations of soil conservation policy were also being laid down. Most experts agree that changes in the American farmed landscape have been much less dramatic than those in the UK; clearing the land for industrialised agriculture has not entailed the same destruction of an elaborate system of hedges, hedgerow trees and other components of mixed farming that it has in Britain. US agriculture is, on the whole, far more extensive than in the UK. Expansionist US farmers have been able to purchase additional land rather than invest in costly reclamation or improvement schemes to spread their fixed costs. Consequently, natural features and

obstructions tend to remain intact, though in some landscapes these are anyway few and far between. By contrast, the cost of farming modernisation in terms of eroded soils and polluted watercourses has been on a scale that would be beyond the comprehension of most British conservationists. Westmacott (1983) observes that rather than protecting farmland from the farmer, the concern in the United States has been to find methods of preserving farmland for the farmer.

During the Dust Bowl years of 1934 and 1935, soil erosion degraded more than 100 million hectares. Today something approaching three-quarters of all US cropland continues to lose soil at the phenomenal rate of 12.5 tons per hectare per year or more. Some 50 million acres are eroding so fast that the problem can only be remedied by taking the land permanently out of agriculture. It has been said that for each bushel of corn produced on the rich lands in the Corn Belt, two bushels of soil are lost. The cost in lost or reduced productivity approached a billion dollars in 1977 alone (Larson *et al.* 1987). Moreover, the eroded soil creates more problems when it is washed off the farm into streams, rivers and lakes. Agriculture, according to the Environmental Protection Agency (EPA), is the main polluter of 64 per cent of the nation's rivers and 57 per cent of the nation's lakes. Together with other types of agricultural pollution, sediment affects 46 per cent of US waterways, reducing fish communities and imposing an annual cost of 6 billion dollars. Finally, there is a severe problem of groundwater depletion in many states. Following a rapidly increasing demand for irrigation in Western areas, groundwater levels are falling by between 15 cm and 150 cm each year beneath 6 million irrigated hectares in eleven states (Ogg *et al.* 1988).

Hammond Bennett, the famous crusader for soil conservation, had—even as early as the 1920s—done much to publicise the soil erosion threat, though it took a combination of economic and ecological disaster, in the form of the Great Depression and the Dust Bowl respectively, to spur the government into action. The Dust Bowl had a lasting psychological impact When in April 1935 Bennett appeared before the Senate Public Lands Committee to testify about the soil erosion problem, the sky suddenly became dark with the dust being blown in from the drought-stricken west; an eloquent demonstration of the need for speedy government action (Rasmussen 1982). Reducing the soil erosion problems dramatised in the Dust Bowl storms of 1934 and 1935 furnished an additional, popular rationale for spending on public works throughout rural areas; the soil conservation effort was rapidly promoted from a modest research and development concern under the aegis of the Soil Conservation Service (SCS) into a national programme of demonstration projects and 'cost-sharing' (subsidies on conservation investment), employing hundreds of thousands of people. From the first, then, soil conservation was closely connected with transferring income to needy rural areas. It was one of the pegs on which the expensive public works programme of the Roosevelt years could be hung.

In 1935 the Agricultural Adjustment Act, which had established the first set-aside schemes, was judged unconstitutional by the Supreme Court, principally because it enabled federal government to regulate and control agricultural production, a matter deemed to be beyond the powers delegated to it. Casting about for a way through this impasse, United States Department of Agriculture (USDA) officials seized on long-term soil conservation as a way of justifying federal government intervention. Under the important Soil Conservation and Domestic Allotment Act of 1936 the USDA was

empowered to ‘make payments for an increased acreage of soil conserving crops’ in order to ‘help control the production of commercial soil-depleting crops’. An Agricultural Adjustment Administration was set up to offer farmers payments to transfer acres between these two categories. It so happened that many of the soil-depleting crops happened to be in surplus in those areas growing surplus crops (Miranowski and Reichelderfer 1985). This presented policy-makers with an apparently ‘win—win’ situation in which they could use the single stone of land diversion to kill the two birds of over-production and soil erosion. During this period ‘the combined programme involved 3.7 million farmers and covered nearly 65 per cent of the total cropland acreage in the contiguous states’ (USDA 1985). Batie (1983) remarks, however, that this compatibility was not always so well marked and that later studies have shown that the amount of erosion control purchased by government through these annual set-aside programmes was not all that large. In retrospect, most commentators recognised that soil conservation was not a central objective of the 1936 law, being more ‘a convenient, universally popular rationale’ which enabled policy-makers to get round the 1933 invalidation.

Soon after the war, with buoyant demand for farm products and expanding export markets, the set-aside programme was mothballed, though soil conservation continued, mainly through government-aided investment in conservation practices on farms such as conservation tillage and contour ploughing. An Agricultural Conservation Programme (ACP) was established in its own right during 1938 to provide ‘farmers with payments and grants to carry out approved soil and water conservation measures’. This was administered by the same Agricultural Adjustment Service which was involved with the commodity programmes that were also being established during this period.

The Soil Bank

The Soil Bank, set up in 1956, marked a return to acreage reduction as a tool to control surpluses and prevent soil erosion. It had two components, an acreage reserve and a conservation reserve. Under the acreage reserve, farmers agreed to reduce their acreage of certain surplus crops (wheat, corn, tobacco, peanuts and rice) by fallowing the land on an annual basis. This was merely a resuscitation of set-aside, albeit on a larger scale than before: in 1957 over 81 million hectares were enrolled, though the scheme was wound up in the following year amid criticism of its excessive net budgetary cost (USDA 1985). Under the rather different and more successful conservation reserve, farmers had to agree to retire much larger portions of their farms for longer periods. Farmers entered into ten-year contracts which obliged them to reduce their total cropped acreage, maintaining an approved conservation cover on the reserved land.

The rate of payment given to a participating farmer was fixed through a system of sealed bids; a farmer intending to enrol land submitted a bid to the USDA specifying the rate which he would be prepared to accept. On the appointed day all bids would be opened and contracts offered to the most competitive. Studies show that this system reduced government outlays by eliminating the ‘windfall gains’ which many high cost farmers would otherwise receive under a fixed ‘offer’ system where the rate is decided by the USDA beforehand (Ogg 1985). It was another example of the way the conservation

reserve introduced new tools and procedures into American farm policy, innovations that would be dusted down and reintroduced in the mid 1980s.

At its peak in 1961 nearly 12 million hectares were enrolled in the conservation reserve part of the Soil Bank. Later assessments show this long-term reservation of land to have been a highly cost-effective way of using land diversion to bolster farm prices and farm incomes as well as contributing to soil conservation. It was found, for instance, that under the bid system farmers required comparatively low payment rates in order to gain their participation. This was partly because most of the land enrolled was unprofitable and often marginal land. Another reason instanced by Brandow (1977) was that the diversion of whole farms rather than just fields or parts of farms enabled farmers to lay off workers and sell machinery, both of which reduced fixed costs and allowed them to submit more competitive bids. These actions also imposed unfortunate social costs, of course, in terms of the 'downstream' impact on unemployment in farming and its allied industries. More recent work by Jagger (1986), however, questions some of Brandow's assumptions and suggests that—contrary to the conventional wisdom—whole farm retirement may not necessarily be cheaper than the retirement of parts of farms. Many farmers have some land which is inherently difficult to farm and which, at least in principle, may be drawn into a long-term reserve at a lower real cost than whole farms. Jagger also found that whole farm enrolment is often more costly where tenants are included in a programme. Despite these qualifications, Jagger joins with the majority of ecologists in pointing to the undoubted conservation benefits and cost-effectiveness of the long-term land diversion that was the central feature of the conservation reserve. It was these advantages that were later to encourage policy-makers to return to the conservation reserve idea in the 1980s.

Fence row to fence row

With the technical revolution in farming well under way, the 1960s and 1970s were decades of mounting surpluses and rising farm-support costs. By this time there were several variants on the basic set-aside theme to control over-production. After 1970 farmers were required to 'set aside' a given percentage of their 'base acreage', an average of the cropped area over the preceding three years, in order to qualify for government price subsidies under the commodity programmes. Later this was tightened up and the acreage limitation schemes required farmers to divert their current plantings to fallow in order to get the subsidies. By this time, however, the food surpluses had evaporated as agriculture entered a brief period of market-led expansion following a rapid growth in export demand that was stimulated by a weak dollar. In optimistic mood, the Secretary for Agriculture exhorted farmers to plant 'fence row to fence row', which they promptly did. Between 1967 and 1977 more than 800,000 hectares of marginal land were brought under the plough, while net farm income surged from 12 billion dollars in 1971 to over 25 billion in 1973 (USDA 1985).

In expanding the harvested acreage, however, many conservation practices were abandoned and the perception began to grow that the severity of soil erosion was increasing. It became clear that the commodity programmes, now expanding production to improve the balance of payments, were in conflict with the soil conservation

programme. Meanwhile, the soil conservation programmes were themselves coming in for critical scrutiny, following an assessment for the US General Accounting Office (GAO 1977) which revealed that the subsidies that were being given to farmers to level land, lime fields and improve drainage were more effective in boosting production than in controlling soil erosion. It also appeared that SCS advisers were frequently out of step with farmers' needs, preparing conservation plans that were overelaborate and inappropriate. The study went as far as to suggest that soil erosion problems were likely to be just as severe on farms with a conservation plan as on those without one. It pointed to the lack of any rigorous evaluations of past conservation programmes and the amount of erosion they had actually prevented. The ever-vigilant American Farmland Trust (AFT) was quick to seize on these reported weaknesses, noting that the GAO 'was pointing to fundamental weaknesses, not just of ACP, but of the voluntary system of conservation in general [which] rests on the premise that it is local people who are best informed about conservation needs' (AFT 1984:6). The USDA subsequently confirmed the Comptroller General's findings that the pattern of cost-sharing had been too indiscriminate and widely spread; some 52 per cent of subsidised conservation practices had been installed on land that was experiencing only moderate levels of soil erosion. It appeared that the agencies, in an effort to gain the support of farmers, had practically offered cost-sharing to every farmer who walked through the door, aiming to spread the largesse as widely as possible (Batie 1983).

Demands grew for new procedures which would ensure that every dollar spent produced a real reduction in soil erosion. The remedy was to implement rigorous selection criteria and to target the soil conservation effort at the very worst affected land. It was a prescription that, not unnaturally, met with resistance from farmers, who campaigned for the geographical distribution of benefits to be preserved. But targeting had already become a rallying cry, both for those concerned about the soil erosion hazard and those anxious to see more cost-effective public spending. The pressure grew following the Resource Conservation Act (RCA) of 1977, which mandated a complete and continuing inventory of the nation's resource problems with the intention of identifying target areas. The resulting information revolution did much to highlight the soil erosion problem in public debate. One remarkable finding which was to affect the design of subsequent conservation programmes was that nearly 70 per cent of erosion above the 'tolerance level' of 12.5 tons per hectare per year was taking place on less than 8.6 per cent of cropland. Moreover, the severest erosion (of more than 28 tons per hectare annually) was confined to just 5 per cent of the land base, accounting for 52 per cent of all sheet and rill erosion. The implication was that the soil erosion problem was much more manageable than previously thought; provided the government could target this crucial five per cent of affected cropland, thereby bringing erosion there down to an annual acreage of 12.5 tons per hectare, then the total volume of sheet and rill erosion in the US could be substantially reduced.

Farming fortunes move in cycles and by the early 1980s, when the reassessment of soil conservation programmes was in full swing, surpluses had once again begun to accumulate as exports sagged due to the grain embargo and the strong US dollar. Acreage reduction was again revived on a large scale when, in 1983, the 'payment in kind' (PIK) programme was introduced. Under PIK farmers were paid 'in kind' for any land which they chose to fallow with feedgrains or cotton taken out of the government's stocks. A

farmer would receive a tonnage of feedgrains and cotton which was equivalent to 80 per cent of his previous average yield of these crops and an amount of wheat that was equivalent in volume to 95 per cent of what he would have received if he had grown the crop himself (Sanderson 1984). To become eligible for these payments in kind, a farmer had first to agree to retire between 10 and 20 per cent of his acreage. Any further reductions up to 50 per cent of the farm's recorded base acreage would then be compensated for by the government. Alternatively, a farmer could chose to retire or 'idle' his entire base acreage, indicating through a sealed bid procedure what percentage of the crop yield would be acceptable to compensate him for this action.

In the event, participation in PIK exceeded all expectations. Indeed, it was embarrassingly high for the USDA, which found itself paying out nine billion dollars worth of government-owned stocks for farmers to retire one-third of the total base acreage of grains and cotton. It appeared that in its anxiety to ensure a respectable enrolment of land, the USDA had offered rewards which few sensible farmers could refuse. Soon afterwards the drought of 1983 sharply reduced production of many previously surplus crops, especially corn.

The conservation impact of the acreage reduction programmes

The controversy surrounding PIK provoked an intense debate in the late 1980s about the future direction of American farm programmes. With surpluses once again beginning to build up following the temporary effects of the drought, the USDA remarked that 'the prospect that we will again be forced to rely on acreage reduction programs to correct supply-demand imbalance makes improvements to increase effectiveness highly desirable' (USDA 1986:7). By this stage the drawbacks of the annual acreage reduction programmes (ARPs) were well-established. It was frequently discovered, for instance, that the total production of a surplus crop over a harvest year was often not reduced by as much as the number of idled or retired acres would suggest it should have been.

This problem is known as slippage and arises for several reasons. One of these is because set-aside is invariably a voluntary arrangement between the farmer and the USDA, giving rise to a 'free rider problem'. For those farmers who agree to set aside land there will always be others who calculate on cropping the land in the usual way. If set-aside programmes mean that the USDA can justify holding market prices higher than they would otherwise be, there will be a clear incentive for such farmers to free-ride on the actions of the others inside set-aside. They will happily expand their acres of planted crops while participating farmers reduce theirs. Slippage can also arise because participating farmers usually select their most marginal acres for the scheme, given that they receive the same rate of payment regardless of the productivity of the land enrolled. Mean-while, technical improvements and the application of more fertilisers and farm chemicals can continue to boost output from those acres that remain in production. This may result in a net increase in output under a set-aside programme. The USDA summed up these and other drawbacks of short-term set-aside when it commented:

> ARPs have generally proven to be a costly and inefficient way to reduce production…. Such programmes seldom achieve their intended results.

> Farmers rapidly increased yields on allotted acreage and overproduction continued to be a chronic problem.
>
> (USDA 1985:10)

By the early 1980s attention was also being drawn to the impact of annual acreage reduction on soil conservation and, specifically, the way the commodity and soil conservation programmes operated at cross-purposes. It was realised that many of the shifts in cropping patterns brought about by price support had exacerbated soil erosion. An influential study (USDA 1986) on 'programme

Table 4.1 Area diverted under US Government programmes (million hectares)

Annual Programmes	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
Corn	2.1	32.2	3.9	5.4	13.9	21.1
Sorghum	0.7	5.7	0.6	0.9	2.4	3.9
Barley	0.4	1.1	0.5	0.7	1.8	2.9
Oats	0.1	0.3	0.1	0.1	0.4	0.9
Wheat	5.8	30.0	18.5	18.8	19.8	19.3
Cotton	1.6	6.8	2.5	3.6	3.4	3.3
Rice	0.4	1.8	0.8	1.2	1.3	1.3
Total	11.1	77.9	26.9	30.7	43.0	52.7
Commodity Programme						
Crops harvested	276.5	223.9	262.1	259.1	240.3	222.0

Source: House of Lords (1988:77)

consistency' revealed how price support increased the profitability of erodible 'row' crops like corn and cotton at the expense of less erodible close-grown crops or pasture, encouraging farmers to put more land into the former. Despite being responsible for the diversion of millions of acres of agricultural land (see Table 4.1), annual acreage reduction had meanwhile done little to reduce the erosion hazard.

The marginal land that is typically enrolled into such schemes is often far from being the most erodible land on a holding; indeed, crop yields on some erodible land actually exceed yields on much non-erodible land. Taking land out of production on an annual basis is, anyway, not generally the best remedy. Farmers are reluctant to make conservation investments on land that is only out of production for one year at a time. If the land is left bare for that period, soil erosion will actually be worse than if the land remained in production. 'The fickle nature of production adjustments has historically made them poorly suited to long-term conservation planning. In addition, production adjustment programmes have provided an incentive to farmers to periodically cultivate marginal lands' (AFT 1984:12). This last point refers to the requirement, under the ARP rules, that set-aside acres must be cropped in two or three years prior to being set aside.

This rule effectively discourages a farmer from installing many conservation practices such as grass, waterways, filter strips or windbreaks on the land.

An idea which rapidly gained support was 'cross-compliance', which requires a farmer either (a) to meet conservation standards or even implement a conservation plan in order to receive price support under the commodity programmes that are linked to acreage reduction (the 'red ticket') or (b) to agree to meet these standards in future in order to be eligible for certain benefits under the programmes (the 'green ticket'). Unfortunately, although more cross-compliance would undoubtedly improve programme consistency, studies have shown that even the red ticket could have only a limited impact on soil erosion. This is because between a quarter and a half of the most erodible cropland is owned or managed by farmers who do not receive price support through deficiency payments or the loan rate scheme (Reichelderfer 1985). Even where a farmer is currently receiving price support, it is uncertain that the threat of losing these benefits will be sufficient to ensure that he followed conservation guidelines.

Various studies have shown that the benefits of deficiency payments and other price supports to American farmers are relatively modest. If, for farmers with high erosion rates, the costs of complying with conservation standards outweighs the benefits of price support, causing them to decide against participating, this will partly defeat the purpose of the commodity programmes. Much depends on the behaviour of agricultural markets. It has also been pointed out that, other things apart, there is not a very precise overlap between the location of surplus crops and the location of the most erodible acres. Less than 3 million hectares of wheat are highly erodible, yet three times that acreage would have to be retired to have any impact on surpluses. At the other extreme, while more than 7 million hectares of corn and soybeans are grown on highly erodible soils, less than 2.5 million hectares of these would have to be retired to balance supply and demand, assuming average yields (Ogg *et al.* 1988). Moreover, soybeans, a particularly erosive crop, is not covered by commodity programmes to begin with. Taking all this into account, the USDA decided that although more cross-compliance was something to be encouraged, it would only partially solve the soil erosion and water pollution problems.

A new Conservation Reserve

Pressure subsequently began to grow for long-term land diversion as a solution to soil erosion and water quality problems. A powerful coalition of interests, which included the American Farmland Trust and the Sierra Club, was formed in 1983 to campaign for a new national policy for agricultural resource conservation. The problem, according to this coalition, was that the farm economy provides powerful incentives for the continuous cultivation of highly erodible land. Government commodity programmes aggravate this situation by actually subsidising the use of 'fragile' lands (land subject to erosion by wind or water), while the soil conservation effort is still poorly funded and too diffuse to have any real impact. In many cases, the problem can only be solved by a permanent shift in land use, usually from tillage to grass or trees. But existing programmes are unable to bring these changes about. The centre-piece of their proposed package was therefore a Conservation Reserve which, modelled on its namesake under the Soil Bank of the 1950s, would encourage long-term land retirement. By retiring land for long periods, it

was argued, policy makers could save dollars as well as soil, since there would be appreciable reductions in surplus production. The Reserve would be targeted at the most erodible or environmentally sensitive land.

These arguments, coming as they did after mounting criticism of the existing programmes, had enormous appeal to policy-makers and farmers. A conservation title was subsequently built into the 1985 Food Security Act, establishing not only a Conservation Reserve, but also a number of other measures which, taken together, altered the incentives under which farmers and operators managed the land. The package included a 16 million hectare Conservation Reserve, conservation compliance, conservation easements and a provision against sodbusting and swampbusting (converting grasslands, wetlands or erosion-prone land to the production of crops). These are summarised in Table 4.2. According to one commentator, it is a combination which succeeds in weaving conservation concerns into the very fabric of farm policy (Meyers 1988).

The conservation compliance provision means, for instance, that conservation is no longer a matter of inclination or choice but may become an economic imperative for a farmer who dare not risk losing government subsidies in difficult times. The limitations of cross-compliance have already been discussed above. Nevertheless, this provision could reduce the erosion of up to 26 million hectares if the conditions are right. The characteristically American-sounding sodbuster and swampbuster provisions also signal a shift in farm policy away from the interests of farmers and towards those of society. The swampbuster provision was agreed in response to growing concern about the loss of America's wetlands: the National Resources Inventory of 1982 had revealed that 2 million hectares of the nation's 30 million hectares of wetland were likely to be converted to agriculture within the next few years. The sodbuster provision is equally fascinating as a policy innovation, though Ogg *et al.* (1988) estimate that its ultimate impact could be limited: of the 4.5 million hectares of land converted from grassland to crops between 1979 and 1981, only 0.25 million (17 per cent) was both highly erodible and being used to grow subsidised crops, the category which the sodbuster provision might have saved.

Table 4.2 The USA 1985 Conservation Title

Key provisions	*Comments*
Conservation Reserve	
Pays farmers annual rental payments and half the cost of establishing cover for retiring highly erodible cropland for 10 years. Target enrolment of 16 million hectares.	Over 40 million hectares eligible; 9 million enrolled by end 1987; reducing annual erosion by 480 million tons.
Conservation Compliance	
Requires farmers with highly erodible cropland to begin implementing a conservation plan by 1990 and to complete it by 1995 in order to remain eligible for price support and deficiency payments, crop insurance, disaster payments and government loans.	Could affect up to 26 million hectares, depending on the conditions attached.
Sodbuster	

Denies benefits listed above to any person producing a farm product on highly erodible land converted since 23 December 1985 unless a conservation plan is implemented.	Affects 90 million hectares with some potential for erosion.
Swampbuster	
Denies commodity benefits to any person producing on farmland converted from swamp (wetland) since 23 December 1985.	Reduces incentive to convert wetlands, of which 24 million hectares are in private hands Up to 6 million hectares convertible.

Source: USDA, various references

The Conservation Reserve Program (CRP) set up by the Act is clearly the most far-reaching of the new measures. It marks a return to the retirement rather than simply the diversion of land and incorporates most of the features which the conservation coalition lobbied for, including the targeting of the worst-affected land and the use of a sealed-bid procedure to fix the rate of payment offered to farmers. It has the dual objectives of reducing soil erosion and its associated effects and cutting into over-production, though the former is to receive priority. Under the Act, the Secretary of Agriculture is empowered to enter into ten-year contracts with owners or occupiers of highly erodible land which has been targeted under an agreed set of criteria. Sign-up periods are announced in advance by

Table 4.3 Enrolment in the Conservation Reserve Programme

Sign-up period	*Area enrolled (m ha)*	*Average rental price ($/ha/yr)*
March 1986	0.75	42.06
May 1986	2.77	44.05
August 1986	4.70	49.96
February 1987	9.48	51.19
July 1987	5.29	48.08
Total	23.00	49.12

Source: Ervin (1988:57)

USDA, during which farmers submit sealed bids which specify how much they must receive to induce them to enrol land. If a bid is accepted (and each state has a ‘pool’ of erodible acres which are eligible for enrolment as well as guidelines about the size of acceptable bids), then the state enters into a contract with the farmer. A rental payment is given for land to be withdrawn from commercial cropping together with a grant of 50 per cent for establishing grass or trees on the land that is taken out. Importantly, the farmer cannot use the land he puts into the Reserve to satisfy the requirement for acreage reduction under the commodity programmes. When the contract expires the land can only

be returned to crops (sodbusted) if a conservation plan has been approved which allows for this.

The USDA aims to enrol a maximum of 43 million hectares in the Reserve by 1990. The signs already look promising: some 23 million hectares had been enrolled by the end of 1987 (which is well above projections) at an average rental price of $41 per hectare (Table 4.3). According to these numbers, the CRP is already a success, but as Ervin (1987) points out, there is a worm in the bud. First, the pattern of enrolment is decidedly uneven. Most acres have been put into the Reserve in the northern plains, the southern plains and the mountain and Pacific states, regions which together account for 70 per cent of the total number of acres enrolled, but which contain only 54 per cent of the land that has been targeted under the CRP. Misgivings are already being expressed about the imprecise way the USDA is implementing what is generally agreed to be a soundly designed programme. So long as a piece of land satisfies the eligibility conditions laid down, it will be accepted into the scheme.

The problem is with the eligibility conditions themselves. Heated debate surrounds how well targeted the CRP really is. Dicks *et al.* (1987) argue that the official definitions are still far too liberal, resulting in plenty of acres being enrolled but not necessarily those acres which would most benefit from being retired. Everything hinges on the 'soil tolerance level' or T-value included in the eligibility definition. But Dicks points out that this measure tends to select acres more for the impact of erosion on productivity, than for the amount of erosion per se, or for the impact the erosion of that particular piece of land is having on water quality. A better target for the CRP would be acres for which erosion is posing an environmental threat in this more broadly defined sense. Such 'environmentally sensitive' land may not only be erosion-prone land but could include areas suffering from groundwater contamination or depletion problems, or even riparian areas and converted wetland. Enrolling such land into a Conservation Reserve, the conservationists argue, will produce more social benefits for society than a field where erosion is merely a matter of soil moving from hilltop to bottom, never leaving the field.

The CRP illustrates the problem of using a single instrument to achieve conflicting goals (Tinbergen 1964), given that the CRP is meant both to save soil and to reduce surpluses. During the first sign-ups, when these were apparently given equal weight, eligibility conditions were lax in order that as many productive acres as possible could be enrolled. Later, the definitions were tightened up so that the soil conservation objective was pre-eminent. But the effect of the early enrolments has been to raise the apparent cost of the CRP per ton of soil saved from erosion. It has been calculated that it cost about 2.78 dollars per ton in those early sign-ups. This compares unfavourably with the ACP which, through its promotion of conservation practice and investment, cost only about 47 cents on average to save one ton of soil. There is an important point here, which is that an undue emphasis on reducing surpluses (by relaxing the targeting criteria) could eventually endanger the CRP itself by raising the perceived cost of achieving conservation goals. In future the CRP will have to compete with other programmes for scarce federal funds, so achieving its conservation goal at minimum exchequer cost (i.e. by not 'contaminating' the Reserve with only moderately erodible acres) will be a deciding factor.

Lessons from the American experience

The US agricultural adjustment and soil conservation programmes, aimed as they are at the large-scale diversion of land, provide some instructive lessons for a European Community which may be on the brink of implementing its own, albeit more modest, land diversion policy. Set-aside to reduce over-production emerges as a bureaucratic and costly policy which continues to be widely used largely because of its popularity with farmers. There have been few beneficial spin-offs for conservation from the acreage reduction schemes that have been in more or less continuous operation since the 1930s. Indeed, the commodity programmes, of which set-aside forms a part, have helped bring about shifts in land use that have often exacerbated soil erosion problems (AFT 1984). By contrast, the CRP demonstrates very clearly the value of a long-term, targeted diversion of land in bringing about shifts in land use that may help reduce the environmental impact of intensive agriculture.

Taken together with the other elements in the conservation title of the 1985 Farm Act, the Conservation Reserve is a remarkable innovation in American farm and resources policy, despite the implementation problems reported above. It underlines the importance of building conservation goals into the design of land retirement schemes rather than leaving any consideration of 'conservation conditions' until the implementation of the scheme. Increasingly rigorous targeting criteria and procedures for screening applications have been built around environmental objectives, not agricultural ones, though there are signs that this principle could be violated in an attempt to stress the multi-purpose nature of the Reserve. On this last point, the CRP also illustrates the drawbacks of overloading individual programmes with too many objectives—in this case using land retirement to cut surpluses can raise the apparent costs of achieving conservation goals.

The debate about targeting the retirement of those hectares that are most likely to benefit society is still continuing. Targeting is one of the most important lessons to be learned from the American experience capable of being applied in Europe. The broader definitions of environmental sensitivity now being discussed in the USA brings the issue closer to home, where the scope for targeting not only land diversion but also other environmental policies is still largely unexplored. The argument that targeting allows for a more efficient use of available resources (maximising benefits while minimising costs) compared to spreading the conservation effort thinly but widely, is a persuasive one. Simply enrolling as many acres as farmers are willing to offer for a given rate of payment, the inclination of European policy-makers at the moment, is neither efficient nor environmentally beneficial.

It might be argued that institutional and environmental differences between the USA and Europe mean that the reserve idea nevertheless has limited relevance in a European context. The most obvious barrier is the different nature and scale of the environmental problem facing European agriculture compared to the USA. Soil erosion and water pollution are resource-use problems which have a direct and measurable impact on productivity and which can be described in quantitative terms. This contrasts with the preoccupation, particularly in the UK, with the conservation of habitats, landscapes and amenities, all more judgmental, emotive and often politicised concepts which are much less open to measurement and technical evaluation (Benson and Willis 1987). In the USA, conservationists have been able to quantify the environmental consequences of past

farming practices and policies with enviable precision, allowing policy-makers to identify trade-offs between alternative programmes. The importance of the National Resource Inventory in catalysing the debate about soil erosion has already been noted. Along with various political pressures, this really fuelled the debate which eventually led to the setting up of the Reserve. The fact that soil conservation and agricultural adjustment programmes have coexisted in the USA since the 1930s is another important consideration. In the UK, conservation and agricultural policies have been notoriously separate, making it more difficult to make the link today. In the United States, the experience of the past is continually being drawn on in the design of new policies, a resource not available to policy-makers in Europe.

Yet the basic validity of the Conservation Reserve and the principles on which it is based still remain. If, as was suggested above, land diversion is to be viewed as a way of exchanging non-market, conservation benefits for compensation payments during a period of adjustment, then the systematic banking of land in a Reserve is probably the most cost-effective and environmentally beneficial way to go about it. To be precise, land diversion programmes will deliver the greatest environmental benefit where they bring about:

1 long-term rather than short-term diversion of land;
2 a change in land use which would not otherwise have taken place within the existing structure of incentives; and
3 a diversion of land in localities, types of countryside or on particular farms with the greatest conservation potential.

The second half of this book examines what a British Conservation Reserve based on these broad principles could look like and how it might be established.

Chapter five
The land surplus

The amount of land potentially available for a Conservation Reserve in the UK is, at least in principle, simply a question of demand and supply. Land will still be needed for food production and other uses such as forestry and urban growth. On the other hand, with continuing improvements in the productivity of agriculture, the nation's farmers should be able to supply more food from a smaller area of land. It is safe to hypothesise that there will be a considerable surplus of land available for other uses, including a Conservation Reserve, by the end of the century. The aim of the land budget to be presented in this chapter is to show how large this 'land surplus' is likely to be. To be precise, it shows how much land could be spared from agriculture, while also meeting the claims of other land uses but without jeopardising the supply of home-produced foodstuffs needed to satisfy expected demand.

Land budgets are useful ways of summarising the balance between the demand for land and its availability. In the late 1960s, when there was great public preoccupation with the loss of farmland to urban growth, people were concerned that there might not be enough land for agriculture by the end of the century. Mellanby (1975) argued that with a healthier diet, such as that of the Second World War, complete self-sufficiency was possible. A detailed study conducted at Wye College (Edwards and Wibberley 1971) concluded that a balance could be struck between competing agricultural and urban uses, given the likely growth of farm productivity. In spite of the fears prevalent at the time, there appeared to be no real shortage of land. The study did not go as far as predicting a land surplus, though it did sketch a scenario in which some agricultural land would be used for exclusively environmental and recreational purposes.

> There may be a future in which agriculture will still be using most of Britain's rural land but doing so in a protective rather than an active role, with the community choosing to forfeit maximum agricultural output in order to create a rural environment which provides for environmental rather than economic needs.
>
> (Edwards and Wibberley 1971:112)

This conclusion provoked some controversy within the agricultural industry at the time and a similar study made at Reading interpreted similar results more pessimistically

(CAS 1976). An ARC analysis of both studies (Wise and Fell 1978) favoured the more optimistic interpretation.

Fifteen years later it is clear that the guarded optimism of the first land budget has been comfortably justified, following a period when the growth in demand for agricultural land, for food and urban growth, has been much less than was foreseen. The relevant question is no longer, 'will there be enough land?' but rather 'how much spare land will there be?' Indeed, the imbalance between demand and supply for farm products in the EC (in 1988) means that there is already, at least in theory, a land surplus, despite an estimated 11 million hectares (or 8 per cent of the utilised agricultural area) having been removed from agriculture in Europe between 1965 and 1983. Wibberley (1983) argues that British (and European) agriculture is already too large. At one point in the mid-1980s it could have been argued that there was the equivalent of some 1 million hectares of surplus arable land across the EC in grain stores (Buckwell 1986). Considering the UK alone and matching supply and demand for just wheat and barley, the statistics suggest that between 500,000 and 800,000 hectares could be removed from production straightaway.

The demand for food

An agricultural land budget for the future must first consider how demand for farm products is likely to change. It is an elementary, but often understated, fact that food surpluses are as much the result of a stagnant demand for farm products as of a rapid rise in farming productivity. Western Europe's population is now growing more slowly than any other world region. It is already on average well fed, some would say over-fed, and expenditure on food is rising more slowly than that on other goods and services. Not only are income elasticities of demand for food low, but they have been falling as real per capita income has increased. In the UK, population in the year 2000 is forecast to be little more than 58 million, an increase of only 3 per cent over 1985 (Office of Population Census and Surveys 1987). This estimate compares with a prediction of 68 million under the 1971 land budget, which underestimated the slump in birth-rate in the late 1970s and the impact of factors such as later marriage and child bearing and the effects of increased female economic activity. The composition of the population is also changing in ways which will reduce the equivalent number of food 'consumer units'. By 2000 there will be a greater proportion of children under 15 and adults over 64, age groups which on average eat less food than others. Hence, although the population is forecast to expand by 3 per cent between 1985 and 2000, consumer units are expected to grow by only 2 per cent (see Table 5.1).

Table 5.1 Population growth estimates for England and Wales

	1985 (millions)	*2000 (millions)*	*Percentage increase*
Population	56.61	58.300	3
Consumer units	45.550	46.450	2

Note: Weightings used to determine consumer units are as follows:

Age groups (years)	*Males*	*Females*
0–4	0.3	0.3×0.875
5–9	0.5	0.5×0.875
10–14	0.7	0.7×0.875
15–64	1.0	0.875
65 and over	0.7	0.7×0.875

Source: Edwards (1986)

As already noted, an important determinant of the effective demand for food by this population is the growth in personal incomes and the proportion of that income spent on food. During the 1970s, incomes have grown on average by 2.5–3 per cent, though this fell to zero in the trough of the recession. Between 1983 and 1986 personal incomes grew by 3 per cent each year. For the future, they are assumed and projected to grow by 2.5 per cent annually up to 2000, giving a probable overall increase of 45 per cent (Table 5.2).

An increase of 45 per cent in income levels does not mean that food purchases will go up by the same amount. On the contrary, basic nutritional needs have long been satisfied in the UK and proportionately less of each income increment is spent on food. The farmers' share of consumers' total expenditure is falling. What increase in expenditure there is on food largely reflects changes in the quality and composition of the diet, rather than any increase in the actual quantity consumed. Furthermore the greater degree of packaging

Table 5.2 Income growth

Range of likely values for average annual rates of income growth (%)	*Range of projected real income in 2000 (1985=100)*
1.5	125
2.0	135
2.5	145
3.0	156

Source: Edwards (1986)

and processing of many foods adds value to retail purchases but results in no extra 'farm gate' demand. Present trends in food consumption show a growing preoccupation with 'health/eating, resulting in a move away from red meat and animal fats and towards a greater proportion of vegetable products in the diet—a reversal of an earlier income-related trend towards animal products. Although individual farmers can benefit from these trends by producing, for example, organic crops, free-range eggs and hormone-free meat, and selling direct to the public, this has little, if any, impact on the total amount of food consumed per head, which is what influences the demand for land. In fact a greater proportion of vegetable products in the diet saves land since animal production is a very inefficient way of using land to provide food (Mellanby 1975). Some 90 per cent of food energy is lost at every step in a food chain so it takes ten times as much land to feed a man on animal products as it does on plant products.

Our analysis of expenditure on food, adjusted for distribution and processing costs, population growth and changing prices, between 1975 and 1985, indicates no apparent growth in food consumption. Demand for food at the farm gate is therefore expected to grow very little as a result of increased incomes between now and the end of the century. What responsiveness there is in the demand experienced by the farmer to changes in income is expressed mathematically, using a coefficient of 'income elasticity of demand for food at the farm gate'* defined using a log-inverse function (a log-inverse function implies a decline in the absolute value of the elasticity coefficient proportional to the increase in income per head. When income tends to infinity the income elasticity tends to zero and consumption is at saturation level). The range of elasticity coefficients chosen in this study

* Income elasticity of demand for the quantity of food purchased at the farm gate is the percentage change in the quantity of food purchased at the farm level corresponding to a 1 per cent change of income.

Table 5.3 Demand for food per head at the farm gate in 2000 (1985=100)

	Range of likely values for annual average rate of income growth (%)			
	1.5	2.0	2.5	3.0
Range of likely values for income elasticity of demand for food at the farm gate				
0.05	101.0	101.3	101.6	101.8
0.07	101.4	101.8	102.2	102.5
0.09	101.8	102.3	102.8	103.3

Table 5.4 The demand for food in the year 2000 combining population and income effects (1985=100)

	Range of likely values for annual average rate of income growth (%)			
	1.5	*20*	*2.5*	*3.0*
Range of likely values for income elasticity of demand for food at the farm gate				
0.05	103.0	103.3	103.6	103.8
0.07	103.4	103.8	104.2	104.6
0.09	103.8	104.3	104.9	105.4

Note: Population in terms of consumer units=102
Source: Edwards (1986)

expresses the very limited possibilities of an increase in demand for farm products and hence farm land, as a result of income growth alone. Table 5.3 shows that even if incomes rise by 45 per cent over the next fifteen years, demand for food per head will grow by only 1.6–3.8 per cent. Combining this with the population and consumer unit forecast made earlier, Table 5.4 shows that the total demand for food will likely increase by only 3.0–5.4 per cent between 1985 and 2000.

The growth in agricultural land

As might be expected in an era of food surpluses, the farming industry is already well equipped to meet this extra demand. The growth of farm output since World War Two, due to the application of management, technology and capital, has been remarkable by any standards, expanding on average at an annual rate of between 2 and 2.5 per cent. In the 1960s agriculture entered a period of very rapid technological progress, mainly due to the technical exploitation of biological potential. A mode of production based on horsepower and man-power has been replaced by systems based on tractors, chemicals and oil. Wheat yields have been boosted by a massive 70 per cent and barley yields by 40 per cent since 1963 (North 1988). As well as directly funding research and development, protectionist agricultural policies have created the climate of security which has encouraged farmers to invest in equipment which incorporates new technologies. For the future, opinion is divided about whether recent historical trends in productivity will be sustained. Some foresee soil erosion, aquifer pollution and fossil energy consumption limiting the environmental sustainability of agriculture. But technological optimists like North (1988) assert that the juggernaut will continue to move forward at a rapid pace as more environmentally benign new biotechnologies enable the creation of high-yield genotypes.

To the extent that much technical progress is 'exogenous', requiring no additional investment on the farm, this could be true. However, if it is accepted that a great deal of the new technology has to be embodied in new capital investment, that is, it is 'partly' endogenous, then reduced market support could slow down the rate of improvement by choking-off future farm investment. Bowers (1988) believes that the price mechanism, if it is given a freer rein, will produce a less intensive exploitation of the land, reduce the growth of productivity and thereby the extent of redundant land. Taking these views into account, the present land budget assumed that future increases in yields will be within the recent historical range of 1.5 to 2.5 per cent per annum. The expected corresponding increase in agricultural output between 1985 and 2000 is presented in Table 5.5.

Table 5.5 The growth of agricultural output per hectare, 1985–2000 (1985=100)

Annual growth rate (%)	*Output in 2000*
1.5	125
2.0	135
2.5	145

Source: Edwards (1986)

Even on those conservative estimates, output could still increase by between 25 and 35 per cent in the space of just fifteen years, easily meeting the increases in demand forecast in Table 5.5. As the later sensitivity analysis will show, output growth is the most crucial factor in determining the size of the land surplus.

The impact of policy decisions on the land balance

Self-sufficiency in food products

In addition to this interaction between demand and supply, the final land balance will depend on the level of self-sufficiency in food products which policy makers decide is acceptable in the years ahead. If higher levels of self-sufficiency are aimed for than at present, this will place additional demands on agricultural land by modifying the demand-supply imbalance. The share of home-produced food in the national diet has been increasing since the 1930s. As currently defined by MAFF, self-sufficiency is 'the value of home-produced food as a percentage of all indigenous food products consumed in the UK' (MAFF 1985b). The value of home-produced food also includes any home-grown food which is exported. On this measure, self-sufficiency has increased from around 60 per cent in the 1950s and 1960s to 80 per cent in the mid-1980s. Much of this increase, particularly in the past ten years, has been due to the growth of exports, especially of cereals, rather than a fall in imports. But exports from the EC impose a financial cost on the Community and are the cause of friction with trading partners. It is consequently unlikely that any further increase in exports, and hence, self-sufficiency, will occur. It might even fall if exports from the UK are reduced as a result of CAP

reform. Nevertheless, Table 5.6 contains a range of values of between 70 and 90 per cent to show the impact of self-sufficiency on the demand for agricultural output. The effect is to reduce effective demand for agricultural land if the self-sufficiency target is lowered.

The demand for land from competing land uses

Policy-makers will continue to allocate land now held in an agricultural use to, among others, forestry, urban and industrial development. In the case of forestry, appreciable areas are likely to be planted to trees as agricultural contraction follows CAP reform. Government has supported forestry since 1919, increasing the UK forest area, through the agency of the Forestry Commission and its grant aid schemes, by something approaching 25 thousand hectares a

Table 5.6 The impact of changes in the level of self-sufficiency on the demand for agricultural output in 2000 (1985=100)

	*Degree of self-sufficiency in indigenous food supplies in 2000**				
	70	75	80	85	90
	Implied percentage change in demand				
	87.5	93.8	100.0	106.2	112.5
Demand (1985=100)					
103.0	90.1	96.6	103.0	109.4	115.9
103.5	90.6	97.1	103.5	109.9	116.4
104.0	91.0	97.6	104.0	110.4	117.0
104.5	91.4	98.0	104.5	111.0	117.6
105.0	91.9	98.5	105.0	111.5	118.1
105.5	92.3	99.0	105.5	112.0	118.7

Note: *Indigenous food products are defined as those grown commercially in the UK
Source: Edwards (1986)

year since the 1940s. The total forest area now stands at 2.3 million hectares or nearly 10 per cent of the land area (Forestry Commission 1986). Compared to farming, however, forestry has received nothing like the same level of state support, even though UK production meets only 14 per cent of market requirements and imports cost some £4.5 billion per year (Agriculture Economic Development Commission 1987). For the past fifteen years planting has averaged 30 thousand hectares a year, with an increasing share being taken by private forestry companies. The government has recently raised the planting target to 33 thousand hectares a year (MAFF 1985b).

With these factors in mind, two estimates of the future forest and woodland area in the UK have been made. The first assumes an annual net increase in forest area of 25

thousand hectares, about the current rate, with 75 per cent of plantings being on uplands or other poor quality land (at least 80 per cent are now). At this rate of planting there will be an additional 375,000 hectares of forest in 2000, equivalent to about 110,000 hectares of average quality agricultural land or 1 per cent of 1985 production potential. To allow for an expansion in forest activity the second estimate suggests an annual increase in area of 40,000 hectares until the end of the century with no more than 70 per cent being on poor land. This increases the area of forest to 600,000 hectares altogether, equivalent to 200,000 hectares of average quality land, some 2 per cent of production potential.

The agricultural land balance

Table 5.7 indicates the likely land balance and the area of surplus land by 2000, before taking into account urban growth, forestry and the existing surplus. It represents the amount by which the projected demand for food (Table 5.4) falls short of projected supply (Table 5.5). As can be seen, the spread is very wide ranging from 1 to 6 million hectares of land, depending on the rate of productivity growth and the level of self-sufficiency which is assumed. Taking a realistic combination of assumptions—a self-sufficiency rate of 80 per cent and annual growth of 2.5 per cent—we estimate the amount of surplus land at between 3 to 4 million hectares.

Table 5.7 Area of land available for other uses by 2000 (million hectares)

	Annual rate of productivity growth (%)					
	2.0			2.5		
	Level of self-sufficiency (%)			*Level of self-sufficiency (%)*		
	75	80	85	75	80	85
Demand (1985 = 100)						
103.0	5.160	4.306	3.434	6.068	5.269	4.451
103.5	5.105	4.233	3.361	5.995	5.196	4.378
104.0	5.051	4.179	3.288	5.941	5.142	4.324
104.5	4.978	4.106	3.216	5.886	5.069	4.251
105.0	4.905	4.033	3.143	5.832	5.014	4.179
105.5	4.850	3.979	3.089	5.759	4.942	4.106

Note: Agricultural land area in 1985:18.168 million hectares (crops, grass and rough grazing)

Land losses

Over the last decade the rate of loss of agricultural land to urban growth has slowed considerably compared to the 1960s and early 1970s. This is largely due to the economic

recession but is also a legacy of a successful policy of urban containment achieved through the planning system. The current rate of loss is about 5,000 hectares a year. Although agricultural land is not in short supply, the planning system still makes it relatively difficult to transfer farm land to urban uses, despite recent modifications to planning procedures (DoE 1987). The demand for land for urban uses, especially housing, is still very strong.

Household formation is growing faster than population and there has been a shift in economic activity away from the traditional industrial areas, with a corresponding shift in the demand for houses. Green field sites, and therefore agricultural land, are much preferred by developers but there is a growing movement advocating the rehabilitation of derelict land which, it has been suggested, could supply much of the land needed by housing and industry for many years. The extent of such derelict land has been estimated at anything from 35,000 to 100,000 hectares but it is both difficult to develop and usually not located in the right areas. In practice, then, it will not make a big contribution to urban land needs, perhaps satisfying 5–10 per cent of requirements.

Using the late Robin Best's 1984 estimates of urban growth of 13,000–14,000 hectares per annum between 1985 and 2000, 200,000 hectares could be lost to agriculture. If, however, space standards are consciously improved, planning restrictions relaxed and economic growth continues to improve, losses might be as high as 300 thousand hectares. This range represents 1.7–2.5 per cent of the crops and grass area of the UK in 1985. At one time it was thought that urban growth usually took better than average quality farm land, but research has shown that this is not altogether true. Bearing this in mind, it has been estimated that 2–3 per cent of agricultural potential could be lost to urban growth between 1985 and 2000.

Combined agricultural land losses to urban growth and forestry between 1985 and 2000 could be in the range 500,000–900,000 hectares, which represents 3–5 per cent of agricultural production potential. This loss would easily be made up in two or three years by the agricultural productivity growth rates suggested earlier (page 65). These estimates are in line with those made by other researchers in recent years. North (1988) has suggested that 1 million hectares might be taken for forestry and farm woodland and 300,000 hectares for urban and industrial development by 2015, which is equivalent to 650,000 hectares by 2000. The Countryside Commission (1987) projects a net increase in urban land of 245,000 hectares and 560,000 more hectares of woodland, totalling 800,000 hectares by 2000.

Subtracting the 0.5 to 0.9 million hectares needed for forestry and urban growth leaves roughly 2 to 3 million hectares potentially available for recreational, conservation and other non-agricultural uses, a potentially huge area. To this should be added between 0.5 and 1 million hectares to allow for the land surplus which already exists in the base year (1985) and which was assumed to be zero in the calculations made above. Alternatively, it could be said that the existing surplus will comfortably satisfy the demand for land for forestry and urban growth between now and the end of the century. Hence, any gains in productivity could be converted entirely into a land surplus available for other uses. Putting these estimates into perspective, a land surplus of 3 to 4 million hectares represents 16–21 per cent of the total area in agricultural production in 1985.

It will be appreciated that calculations like these are highly sensitive to the assumptions about demand and supply. Table 5.8 suggests, however, that changing the

assumptions about population and income growth and the size of the income elasticity of demand for food has little impact on the final result. The size of the land surplus is much more sensitive to the level of self-sufficiency which is assumed, with a 1 per cent increase being translated into almost 200,000 hectares of extra land being needed by agriculture. The most important parameter is productivity growth; an additional rise in productivity of 0.5 per cent per year releases 1 million hectares of extra land for other uses by 2000. Just two or three years of productivity growth at the rates suggested here would cancel out 15 years of land losses to forestry and urban growth.

The results of the Wye land budgeting exercise have been echoed

Table 5.8 Sensitivity analysis—land available for non-agricultural uses by 2000

Parameters	*Population*	*Income growth p.a. (%)*	*Income elasticity of demand for food at farm gate*	*Self-sufficiency level (%)*	*Growth of agricultural output/ha p.a. (%)*	*Land available for non-agricultural uses(mha)*
Reference assumptions	57.8	2.0	0.07	80	1.5	3.052
Population	57.6	–	–	–	–	3.106
	58.0					3.106
Income growth	–	1.5	–	–	–	3.125
		3.0				2.961
Income elasticity of demand for food at the farm gate	–	–	0.03	–	–	3.206
			0.09			2.979
Self-sufficiency level	–	–	–	75		3.997
				90	–	1.163
Growth ofagricultural output/ha	–	–	–	–	0.5	0.672
					3.0	6.050

Note: A dash denotes that the reference assumption has been used
Source: Edwards (1986)

by other studies. One of the most thorough has been that prepared by North (1988) for the year 2015, again using 1985 as the base year. North is highly optimistic about future productivity improvements in agriculture, assuming that a combination of higher-yield genotypes, improved disease and pest control, more efficient nitrogen use and growth

regulators will boost productivity increases to at least 3 per cent per annum. He describes two alternative scenarios, one ‘efficient’, which relies on market forces to move land, labour and capital out of farming as the efficiency of production continues to improve, the other ‘protectionist’, where government continues to support large numbers of people working on the land. Under the efficient scenario, land could be released from agriculture in the same discrete way that has been assumed above. North suggests that there would need to be only 8.1 million hectares of land producing the cereals, milk, beef and sheep we will need by 2015 compared to 14.4 million in 1985. Assuming a linear trend, the 6.3 million hectares of surplus land in 2015 is equivalent to 3.2 million hectares in 2000, which agrees well with the estimates presented here.

A study commissioned by the Nature Conservancy Council (Gould 1985) has also attempted to estimate the size of the land surplus. Their approach was to examine trends in demand and supply within different sectors, assuming existing policy measures remain unchanged. It was estimated that between 2.4 million and 2.9 million hectares could be in surplus by 2000 (though this excluded Northern Ireland). Table 5.9 brings these and other estimates together. As can be seen, both the Wye 1971 and 1986 land budgets and North’s ‘efficient’ solution appear less conservative than estimates made by Gould and others.

The crop balance

Despite its usefulness as a way of visualising degrees of freedom, the ‘global’ land surplus predicted by the land budget exercise takes no account of the great differences in production in different parts of the country (Less Favoured Areas cover over 50 per cent of the agricultural land area but produce only 15 per cent of the output). Nor does it take account of important differences in the supply and demand balance for different agricultural sectors. But British agriculture is a composite of livestock and arable enterprises. Productivity growth in the livestock sector might be expected to increase at a different rate from the cereals sector, for instance. Moreover, the consumption of meat is not following the same trend as the consumption of cereals. These differences could be significant in determining where in the country land will be surplus to

Table 5.9 Comparison of estimates of land surplus to agriculture

Study	*Definition employed*	*Area*	*Year*	*Range of estimates (m ha)*	*Equivalent for 2000 (m ha)*
Wye College Land budget 1986	Farmland available for other uses	UK	2000	0.9–6.1	2.8–4.3
Wye College Crops balance 1987	Land surplus to requirements	UK	2000	1.8–3.6	1.8–3.6

Wye College Land budget 1971	Farmland available for other uses	UK	2000	4–6	4–6
North 1988	Land surplus to needs assuming economically efficient production	UK	2015	6.3	3.15
Laurence Gould 1985	Surplus areas of major crops	GB	2000	2.4–2.9	2.6
Reading University 1986	Area equivalent required reduction in intensity	E&W	5 yr	0.2–2.2	1.3–1.9
NFU 1986/7	Land available for other uses	UK	p.a.	0.15	2.25

Source: adapted from Bell (1987)

requirements and hence the land use implications of interactions between demand and supply. A separate exercise was therefore undertaken, examining enterprises individually to assess how demand and supply conditions could change during the next fifteen years and estimating whether these implied an expansion or contraction in the area of land required. These results were then put together to give an independent estimate of the 'global' land surplus.

Tillage crops

Not surprisingly, *cereals* contribute most to the potential surplus in the tillage area. Cereal output in an average year is now 22 million tonnes. Home demand however averages less than 20 million tonnes and is falling. Cereal yields continue to improve. It is estimated that most of the 1 to 1.67 million hectares of tillage which could be

Table 5.10 The area of land required for cereals in 2000 (thousand hectares)

	UK demand for cereals (million tonnes)		
	18	20	22
At 1985 average yields	3249	3610	3971
	(751)	(390)	(29)
At a 2.5% p.a. yield increase			
1985–2000	2242	2491	3971
	(1758)	(1509)	(2740)
At a 2.0% p.a. yield increase			
1985–1990 and 1% 1990–2000	2691	2990	3288
	(13909)	(1019)	(712)

Note: Figures in parentheses show land which could be released. The UK cereal area in 1985 was 4 million hectares
Source: Edwards (1987)

released by 2000 will be cereal land. As a rough guide, we estimate that up to 200,000 hectares could be released for every half a percentage increase in yields. Table 5.10 presents three levels of UK demand showing the projected land surplus on different yield assumptions. As can be seen, even at 1985 yields, we are already using too much land to grow cereals. Two levels of yield improvement are suggested. At a maximum one might expect a continuation of post-war trends, with annual improvements of 2.5 per cent. More realistically, yields can be expected to increase by 2 per cent annually in the short term and thence level off to 1 per cent up to 2000.

Oilseed rape is next in importance. The area under this crop has grown rapidly over the last decade, though Brussels is now signalling that it wishes to check this expansion. A maximum oilseed area of 350,000 hectares is registered for 2000, though this could fall to 250,000 or even 200,000 hectares if production is 'capped' at 1 million tonnes and yields continue to improve. Unlike oilseed, the area of main crop *potatoes* is already controlled by quotas administered by the Potato Marketing Board. It has been falling gradually at about 1 per cent a year in line with an unchanged or slightly falling demand and improving yields. On this basis, if yields increase by 1.5 per cent a year between now and 2000 the area of main crop potatoes will have to be reduced by 30,000 hectares. The area of *sugar beet* is similarly controlled, with British Sugar plc contracting with producers to grow a certain tonnage each year, with excess deliveries incurring a levy. The sugar beet area has thus remained static at 200,000 hectares for the last twenty years. A combination of improved yields and more efficient processing has meant that UK sugar production has increased considerably without any change in area. Any further yield increases will require a smaller area of sugar beet. A 1.5 per cent annual increase will release 40 thousand hectares by 2000.

Horticultural crops presently occupy between 225,000 and 250,000 hectares, though the area has been steadily declining for the last thirty years. Despite this, the high value of products mean that this sector contributes 10 per cent to the value of all agricultural output. However, there are few signs of much future growth in demand for horticultural products; in sectors such as salad vegetables and soft fruit a buoyant level of consumer demand is increasingly being met by foreign suppliers. It is likely that, with improving productivity, the horticultural area will fall by 30,000–40,000 hectares by 2000.

As far as *other tillage crops* are concerned, the total area occupied is expected to remain unchanged, though the mix of crops will change. More peas and beans will be grown and less stockfeeding crops such as kale, cabbage and mangolds. The present forecasts do not anticipate a significant increase in the area of alternative crops. Climate constraints, limited markets, a lack of processing facilities and competition from imports suggest that even on the most optimistic assumptions, only 100,000 hectares is likely to be given over to alternatives like lupins, sunflowers and flax by 2000. These estimates are brought together in Table 5.11.

Table 5.11 The area of land required for tillage crops in 2000 (thousand hectares)

	Area in 1985	*Area in 2000*	*Land freed*
Cereals	4,015	2,500–3,000	1,015–1,515
Oilseed rape	296	250–350	(54)–46
Potatoes	191	161–171	20–30
Sugar beet	205	165–175	30–40
Horticulture	226	186–196	30–40
Other crops	332	332	0
Alternative crops*	0	50	(50)
Total	5,265	3,644–4,274	991–1,621

Note: *In 1985 included in other crops
Source: Edwards (1987)

Grassland

The tillage area is now as great as it has ever been in peacetime, with almost 2 million hectares of grassland having been ploughed or developed since the late 1960s. Most of this reduction has been of temporary grassland and rough grazing due to the specialisation of production and the improvement of land respectively. Despite this, grassland still accounts for over 70 per cent of the UK agricultural area, cattle and sheep making up 42 per cent of the value of all farm output. The grassland sector has enjoyed rapid productivity growth and has the potential to achieve much more, particularly in South-west England and in Wales. Much, though, depends on the general health of the agricultural economy.

Traditionally, land has always reverted from arable cropping to pasture in bad times, and farmers have made a living from non-intensive livestock systems with costs kept to a minimum. The agricultural situation in the 1980s and 1990s has made this an unrealistic scenario. The principal livestock products are already in oversupply, with the possible exception of sheepmeat and wool. The individual farmer cannot solve his problems by switching from crop to livestock production without substantial investment, as arable farms lack fencing and appropriate buildings as well as skilled stockmen. Pigs and poultry are generally produced in intensive systems which use very little land but involve heavy capital outlay. And with milk now produced under a quota system, new entrants only replace outgoers and then only at considerable cost. The exotic alternative livestock enterprises such as llamas, snails, reindeer and so on are only feasible for a handful of enthusiasts. Even the more conventional alternatives such as horses, goats and milking sheep are unlikely to be more than small-scale enterprises involving relatively few farmers. If some good land growing arable crops were switched to grazing livestock enterprises the output would only tend to displace that from farms on poorer land, although farmers in Less Favoured Areas would be protected to some extent by subsidies.

In the event of a squeeze it is farmers in the 'middle countryside' (CAS 1986) who would probably suffer. Their arable cropping returns are relatively low and they have insufficient advantage in grassland farming to compete with farmers on better land or with subsidised products from LFAs. Whatever its role in absorbing agricultural change, the actual demand for grassland will be determined by what happens in the grazing livestock sector between now and the end of the century.

Dairy farmers reacted to quotas by quickly reducing cow numbers, cutting down on concentrate feeding and making more use of grass. Average yields fell, but once the dairy sector settles down to the new regime, yields are forecast to increase again to 1.0–1.5 per cent each year. With no increase in quota the number of dairy cows will fall by between 15 and 25 per cent by 2000 (Table 5.12). As the dairy herd provides about three-quarters of UK beef cattle, this will have an

Table 5.12 Numbers of dairy and beef cows (millions)

	1985	*2000*
Dairy cows	3,150	2,680–2,360
Beef cows	1,333	1,233–1, 133
Total	4,483	3,913–3,493

impact on beef production too. The number of beef cows reached a peak in 1975, after almost doubling in the previous ten years. Since 1975 there has been a considerable fall in numbers although the rate has slowed down recently. In view of the beef surplus and the poor profitability of beef production, further falls in beef cow numbers of between 7 and 15 per cent are forecast (Table 5.12).

The total number of dairy and beef cows in 2000 will probably be in the range 3.5–3.9 million, an overall fall of 13–22 per cent in cattle grazing units since 1985 (this of course assumes the widest range of possibilities), but the greatest fall in dairy cow numbers might be associated with the smallest fall in beef cows and vice versa, giving a range of 3.6–3.8 million or a fall of 15–20 per cent. With no change in stocking densities this would imply a similar fall in the forage area required by the dairy and beef sectors.

In 1985 there were 13.9 million ewes in the UK and a total sheep population of 35.6 million (including lambs). Numbers have increased fairly steadily at 2 per cent a year since the late 1940s but the rate has accelerated during the 1980s. Sheepmeat and wool are the only livestock products that are not overproduced in the EEC, but even so sheep production offers only very limited opportunities for expansion. There is a trend away from the consumption of lamb and mutton and although the UK in 1985 was only 55 per cent self-sufficient in sheepmeat, and the EEC 74 per cent, trade agreements and the seasonality of supply make imports difficult to replace, while the EEC market itself remains hard to penetrate. Considerable quantities of wool are imported every year but wool production alone is not profitable enough in the UK. Nevertheless, some UK farmers still seem willing to give sheep a try. By 2000 there are likely to be between 41 and 42 million sheep in the UK, an increase of between 15 and 18.5 per cent. This includes milking sheep, a small but growing sector, and allows for an increase in the

number of goats, kept for both milk and fibre. At present stocking levels this gives an increase in the demand for sheep grazing land of 15–18.5 per cent.

In 1985 cattle made up 80.5 per cent of all grazing livestock units and sheep 19.5 per cent. If the forecast stock numbers for 2000 are combined and compared with grazing livestock units in 1985, there is

Table 5.13 The impact of changes in stocking rates on the area of 'surplus' grassland

Change in stocking rates (%)	*% of 1985 grassland area needed in 2000*	*'Surplus' in 2000 (k ha)*
0	85–93	90–1930
−2	86.7–94.9	658–1716
−4	88.4–96.7	426–1496
−6	90.1–98.5	193–1277
−8	91.8–100.4	(52)–1058
−10	93.5–102.3	(296)–839

Source: Edwards (1987)

a fall of 7–15 per cent, indicating that only 85–93 per cent of the 1985 grassland area will be needed, if stocking densities remain the same. This 'frees' between 900,000 and 1.9 million hectares of land. Some deterioration in stocking rates is very likely, however, which implies a drop in the productivity of grassland. A fall in stocking rate means that fewer animals are kept per hectare as the system becomes less intensive. In Table 5.13 the impact of changes in the stocking density on the grassland 'surplus' is illustrated.

For example, if stocking rates in 2000 are 2 per cent below those in 1985 the area of 'surplus' grassland is reduced to between 700,000 and 1.7 million hectares. Roughly each 1 per cent overall fall in stocking rates means that sheep and cattle require 100,000 hectares more grassland. If we take the higher forecast of grazing livestock for 2000 (13 per cent less cattle, 18.5 per cent more sheep), a 10 per cent fall in stocking rates implies an actual increase in the area of grassland needed above 1985 levels.

The enterprise balance

The consolidated results of the individual enterprise study are set out in Table 5.14. As there are so many possibilities, to simplify matters a minimum and a maximum set are given but readers may use whatever combination they think most likely from the data in the text. Cereals and grassland dominate the estimates and the level of stocking density on grassland has an extremely important bearing on the area which could be surplus.

Looking at the tillage area first, the maximum that could be released is in the range of almost 1 to 1.62 million hectares, most of it cereal land. With no change in stocking

density a maximum of nearly 2.0 million hectares or a minimum of 900,000 hectares of grassland could be surplus. In total, therefore, a maximum of 3.55

Table 5.14 Land surplus in 2000 (thousand hectares)

	Minimum	*Maximum*
Cereals	1010	1509
Oilseed rape	(50)	50
Potatoes	20	30
Sugar beet	30	40
Horticultural crops	30	40
Alternative crops	(50)	(50)
Grassland (at 1985 stocking levels)	900	1930
Grassland allowing for a fall in stocking levels of		
a) 4 per cent	425	1500
b) 10 per cent	(300)	839

million hectares or a minimum of 1.89 million hectares of ‘surplus’ land is indicated by this study. This broadly agrees with Table 5.7 of the land budget (p. 68) at the lowest level of agricultural productivity (given there as 1.5 per cent). It has to be remembered that no increase in the productivity of grassland has been suggested in the enterprise balance study which, as grassland represents so much of farmland, must keep overall productivity growth low.

If the productivity of grassland falls, the area of surplus land is significantly reduced. If, say, stocking levels in 2000 are 4 per cent lower than in 1985, 400,000 hectares less land is ‘surplus’. A 10 per cent fall in stocking levels implies that one million hectares more should remain in agriculture. A sensible comparison with the land budget can then only be made at an even lower overall productivity growth rate. Table 5.15 gives a modified version of Table 5.7 in the land budget by including a 1.0 per cent productivity growth rate which roughly corresponds to a fall of 10 per cent in grassland productivity by the year 2000 but an increase in the productivity of the tillage and livestock sectors. It shows that the results of the enterprise balance study again broadly agree with those of the land budget.

The enterprise balance study shows that ‘surplus’ farmland could be of the order of 2 to 3.5 million hectares (before allowing for urban and and forestry) but, once again, it illustrates how crucial agricultural productivity growth is to the balance between different land uses. Given modest overall gains in productivity there is no need to worry about land provision for food supply, urban growth, forestry or conservation uses. But if farmers respond to measures to restrict output by using grassland more extensively, which is a

fairly logical scenario, then the land which can be spared by agriculture is significantly reduced.

Table 5.15 Area of land available for all other uses by 2000 (million hectares)

	Annual rate of productivity growth (%)					
	1.0			1.5		
	Level of self-sufficiency (%)			*Level of self-sufficiency (%)*		
	75	80	85	75	80	85
Demand (1985=100)						
103	2.90	1.899	0.890	4.124	3.198	2.253
104	2.762	1.744	0.727	3.997	3.052	2.107
105	2.616	1.581	0.545	3.852	2.907	1.944

Conclusion

The land budget presented here appears to suggest that very considerable amounts of land could be withdrawn from productive agriculture without in any way jeopardising current levels of self-sufficiency in food products. Of course, it does not follow that land will necessarily come out of production on anything like the scale predicted. The measures now being implemented by policy-makers discussed in Chapter 2) will encourage farmers to reduce the intensity of production and make substitutions between enterprises at the margin, with land being set aside or abandoned on only a modest scale. There is certainly plenty of scope for more extensive farming. The crop balance study (page 78) demonstrates that a 4 per cent reduction in stocking densities on livestock farms could effectively reduce the land surplus by 400,000 hectares in 2000, while a 10 per cent reduction would mean a million fewer surplus hectares. Under North's 'extensive' scenario, there will be 3 million hectares less of surplus land by 2015, equivalent to 2.3 million hectares in 2000 (North 1988). Indeed, economists like Harvey and Whitby (1988) maintain that it is fallacious to assume that a production surplus should be translated into a land surplus. Inputs and resources with better things to do will be withdrawn first. The concept of a Conservation Reserve suggests, however, that some land, in the right place and on the right farms, does already have a socially beneficial alternative use. Properly interpreted, the land budget sets upper limits to the potential size of this Reserve. The indications are that he room for manoeuvre is very great.

Chapter six
A Conservation Reserve

The setting up of a Conservation Reserve in the UK would mark a new departure for British conservation policy, establishing conservation as an alternative land use in its own right and reintroducing woodland, grass, scrub and more specialised habitats into parts of the countryside that have sustained some of the greatest conservation losses in recent years. Greater public access could also result and some of the resource problems in farming could be alleviated. As has been seen, the American experience provides some essential clues about how such a Reserve should be established and managed, though the somewhat different nature of agriculture and environment conflicts in Europe, and especially the UK, suggest important differences in emphasis and approach. The prevention of soil erosion and water pollution might appear less important in a British context compared, for instance, to the restoration or recreation of habitat, or even the creation of new wilderness areas on the land rescued from agriculture. In this latter sense, establishing a Conservation Reserve could very substantially expand the 'conservation estate' by bringing about permanent shifts in land use on a large number and variety of holdings, with government paying farmers to produce CARE goods on the diverted land.

New habitats established under a Conservation Reserve programme would not, by any means, compensate for what has already been lost. They would probably not be as rich or ecologically varied as existing semi-natural areas for a very long time. Nevertheless, a countrywide Conservation Reserve is a powerful idea which could greatly increase the diversity and visual amenity of the countryside. It is difficult to prescribe just how large such a Reserve should ideally be, though diverting a few hundred thousand hectares would clearly be feasible given the projected degrees of freedom implied by the 'land surplus'. According to Table 6.1, the existing conservation estate presently covers some 15–20 per cent of the total land area. Putting this land into a Conservation Reserve, together with the land diverted from agriculture, could promote conservation into a major land user over large parts of the UK.

Table 6.1 The conservation estate in England and Wales

Designation[1]	*Area (ha)*
National Parks	2,360,000
Areas of Outstanding Natural Beauty	1,708,500
Environmentally Sensitive Areas [2]	110,495
National Nature Reserves	133,840
Sites of Special Scientific Interest[3]	1,364,404
Local Nature Reserves	7,919
County Trust Reserves	32,410
RSPB Reserves	34,484
National Trust	262,783
Country Parks	21,296

[1]Not mutually exclusive categories
[2]Land enrolled in ESA agreements, June 1989
[3]As at 31 March 1987

Which land?

The targeting of land for enrolment into a Conservation Reserve is a basic requirement if scarce funds are to maximise environmental and social benefits from land diversion. Griffen and Stoll (1983) point out that targeting is a central feature of any public policy because it enables policy-makers faced with limited budgets to rank social and economic objectives. Under a voluntary Reserve programme, the ring-fencing of 'eligible' countryside is inevitable if land diversion is to be attempted in areas, or farms, where it is likely to be most cost-effective and meet with the most favourable response from farmers. This may be regretted by those who regard with suspicion any new proposal to carve up the countryside. Adams (1988) rightly criticises the concept of a partitioned countryside, in which the idea of 'key sites' has sunk deep into conservation thinking. Yet it is hard to escape the essential logic of targeting in a world where funds for conservation are finite. The alternative is to accept a 'scatter-gun' approach, in which land is diverted on a large number of farms in many different locations. Targeting has the positive merit that it allows policy-makers to offer higher rates of payment to a smaller target population of farmers, with the aim of maximising participation among this group, than if payments were open to all comers, no matter where they farmed.

Even a cursory glance at the agricultural geography of the UK suggests that certain areas or regions will benefit more from land diversion than others; reintroducing grassland into areas dominated by specialised, monocultural cereal production will usually be more valuable than doing the same thing in an area of mixed farming, for

instance. Likewise, paying farmers to divert their entire farms may be easier to achieve in areas where there is already a preponderance of farmers near retirement and without successors, than in areas farmed by expansionist agribusinesses or established family farms. The point is that the UK cannot be thought of as if it were uniform. Great differences in topography and climate as well as in the social structure of agriculture mean that careful thought needs to be given to precisely where land diversion should take place.

In fact drawing lines on a map may not be the only way of ensuring that scarce funds reach their target. In putting forward proposals for new farm support systems, the Countryside Commission (1989) present an alternative, which is simply to draw up a menu of payments for specified management tasks, and offering this to farmers but without specifying target areas. Farmers in some areas would have a longer menu to choose from than others because the area they farm has a greater conservation potential or interest, but all farmers would have something available to them. So far as creative conservation is concerned, targeting could still take place because not everyone would be eligible for the same number or level of payments—but it is an indirect, disguised form of targeting. The approach in this chapter is to assume that target areas will be directly defined, though the results of the exercise might just as well be plugged into the menu system.

Where target areas are being defined it could be argued that screening should also be used. This would operate once applications from farmers in eligible areas had been received Each would be assessed for its value for money and conservation-effectiveness; only the most cost- and conservation-effective land diversion proposals being accepted. But this implies accurate evaluations of the conservation benefit which can be set against the real resource costs of the hectarage payment. Generally accepted methodologies for the evaluation of landscape, amenity and wildlife benefits are not yet available. Even a relatively crude targeting of land is severely handicapped by the lack of good data describing the environmental vulnerability or conservation potential of different areas. In the absence of such an information base, an attempt can nevertheless be made to indicate in broad terms where the target areas under a Conservation Reserve might be, using mainly physical data. Three main sets of environmental benefits could accrue from the diversion of land from agriculture, and these can be used as objectives for targeting Conservation Reserve land.

Criterion 1: Mismatch

The mismatch criterion enables cropping patterns to be matched more appropriately to those environmental conditions best able to sustain them.

Although the major regional differences in topography and climate in Britain are reflected in differences in the main agricultural enterprises, environmental constraints are commonly over-ridden or disguised by socio-economic factors. Thus high cereal prices and improved technology have led since the war to inherently poor land being brought into arable production, even in those cooler and wetter north-western parts of the country where livestock production is better adapted to the local conditions. Much of the impact of Body’s (1982) famous polemic against British agriculture was due to his argument that, under the influence of price support, land really suitable only for livestock

production (of mainly Grades 3, 4 and 5) had been ploughed up and put into an arable use. Body used the analogy of 'growing bananas on the side of Ben Nevis' to make the point that too much lower-grade land was being wrongly used. There are over-simplifications in this argument: Body's bold prescription that tillage should be confined to Grade 1 and 2 land ignores the particular circumstances which made it sensible for some parcels of poorer land to be cultivated (Wibberley 1983). Nonetheless, as a general guiding principle, there is validity in using a Conservation Reserve to bring about an improved matching of land use to land capability by targeting land where current cropping patterns are not properly matched to land capability.

Land is a vital community resource, and the penalties of 'mismatching', i.e. using poorly suited land when better land is available, can be considerable. Recent research (Burnham *et al.* 1987) using farm management survey data for south-east England, indicates that whereas yield differences between land quality grades may be relatively small (Table 6.2), the comparable yields on poorer land can only be achieved through much higher applications of fertiliser and agrochemicals (Burnham *et al.* 1987). Fixed costs can also be higher for a farmer who attempts to grow arable crops on 'unsuitable' land. Thus, excessively sandy soils, with a low capacity to retain water and nutrients, may impose extra capital costs for irrigation equipment as well as extra variable costs for applying water and fertilisers. Ill-drained, clayey soils will impose capital costs for drainage systems and extra machinery to deal with field operations in the few 'work days' when the land is in a suitable condition. Heavy soils demand slower work rates and extra operations such as subsoiling, which impose additional recurrent costs.

Table 6.2 Yields of principal crops in south-east England (1974–1985) by agricultural land class (percentage of average yield)

	Agricultural land quality grade				
Crop	*1*	*2*	*3*	*4*	*Significant differences ('t' test at 51% or better)*
Winter wheat	115	110	94	93	1, >3, 1, >4
Winter barley	124	110	97	80	1, >2, >3, 4
Spring barley	115	109	98	77	1, 2, >4
Winter oats	107	118	94	90	1,2, >3, 4
Oilseed rape	105	107	109	–	–
Maincrop potatoes	102	104	101	71	1, 2, 3, >4

Source: Buraham et al. (1987)

Soil compaction, soil erosion, flooding, the pollution of aquifers and other environmental damage is often a consequence of this failure to match the quality of land with the enterprises it can best sustain. This inevitably leads to a second set of objectives for land diversion.

Criterion 2: Vulnerability

The vulnerability criterion protects environmentally vulnerable land from degrading uses.

The handing on of land to one's heirs in 'good heart' was traditionally an important consideration in farming. The sustainable use of land must remain a major objective. Unfortunately, increasingly large areas of farmland in the UK are affected by soil erosion and pollution of various kinds, all symptoms of unsustainable land use (O'Riordan 1983). The vulnerability criterion would target the worst-affected land in order that the appropriate changes in farming practice and land use can be made within 'environmentally sensitive' areas. Water erosion of arable land, especially by rills, is now not uncommon in England and Wales, while sandy and peaty soils are known to be vulnerable to erosion by wind. It has been estimated that some 73,800 km^2 (9 per cent) of the agricultural areas of England and Wales has been affected by erosion during the last decade, typically in situations where arable land is bare of crops (Evans and Cook 1986). Long sloping land and steep valley sides and bottoms are particularly at risk.

The pollution of aquifers due to nitrate run-off from arable land is another increasingly well-documented hazard. Again, vulnerability is likely to be area-related, with outcrops of the 'unconfined' principal British aquifers which are covered by freely draining soils being most at risk. A Department of the Environment working group (DoE 1986) has pointed out that a knowledge of hydro-geology and soil characteristics should enable vulnerable areas to be designated as aquifer protection zones. They recognise that the most effective protection policy would then be to encourage a shift in the land use of such areas, noting that 'the prohibition of arable crops could very effectively remove any nitrate problem if replaced by permanent grass or forestry'. A more recent follow up study of ten catchments covering 35,700 hectares suggests that controls on crops and fertiliser use in catchments would have less effect on farm incomes than more stringent controls in more localised protection zones (DoE 1988).

A third environmental hazard is the vulnerability of agricultural land to periodic flooding. Many parts of the UK, usually floodplains and grazing marshes, have been given protection against flood damage by costly tidal barrages. Bowers (1983), reviewing these investments, questions whether the supposed agricultural benefits which follow from agricultural intensification, in what are often areas of high conservation value, really justify many such schemes. His thesis is that too much social capital has been diverted to subsidise these large-scale agricultural land drainage projects. Clearly, remaining areas which are still subject to high return periods from flooding should be targeted for land diversion (where a partial conversion from permanent pasture to arable has already taken place). Re-establishing a low-intensity pastoral agriculture in such areas under a land diversion programme would create an agricultural system which is both environmentally benign and better adjusted to the level of flood risk (winter floods do little or no damage to a system based on summer grazing and permanent pasture). Such restoration of arable to grass or other types of vegetation might do much to restore wildlife and amenity

habitats lost to agricultural intensification. This has already been introduced in the South Downs Environmentally Sensitive Area and should be a major environmental objective of set-aside.

Criterion 3: Conservation potential

The purpose of the conservation potential criterion is to restore natural and semi-natural ecosystems for wildlife and amenity.

There has been wide discussion amongst conservationists about how far land diversion could facilitate the restoration or partial creation of habitat which has been lost or degraded over the post-war period (NCC 1984). Creative conservation can mean both the re-establishment of original areas and their ecosystems as faithfully as possible and the establishment of new ecosystems which, although they may well resemble existing or past ecosystems, are not necessarily a faithful copy of them. The latter is likely to be easier to achieve than the former. The NCC has already identified a number of opportunities for creative conservation, including:

- the widespread creation and maintenance of herb-rich grassland, using commercially available conservation seed mixtures followed up by low-intensity management techniques;
- the creation of heathland in areas where it has declined, especially in Dorset, Hampshire and the Breckland;
- the restoration of washlands and temporary or permanent wetlands through structured reductions in drainage standards in appropriate areas; and
- the establishment of ‘wilderness areas’ through the abandonment of intensive management.

But creative conservation of this type is likely to be a lengthy and complicated business which will be easier for some habitats such as wetland and species-rich grassland than for others such as woodland. Moreover, the opportunities for restoration will not be the same in all areas. It should, for example, be easier to create habitats in areas already containing nature reserves, blocks of existing semi-natural habitat or other reservoirs of species which can act as sources for recolonisation and establishment. Ecological research suggests that a series of inter-linked habitats or ecological ‘stepping stones’ are important if species are to be dispersed over a wide area. There is also evidence that the surrounding vegetation influences the fauna of isolated habitats such as heathland (NCC 1987).

The kinds of habitat which can be restored will be largely determined by the prevailing local environmental conditions of climate, topography and soils. In most of Britain, in the absence of management, various kinds of woodland would eventually result. With low-intensity agricultural management, such as that practised on ESAs, more open communities of wetland, heathlands, moorlands and grasslands will be produced.

An approach to the selection of target areas

Environmentally Sensitive Areas represent the nearest approach to a targeted conservation policy which has so far been implemented in Europe. In Britain the ESAs designated in the first and second tranches were selected from a much longer original list in what was essentially a targeting exercise. Their identification and winnowing down was undertaken by MAFF in close collaboration with the CC, the NCC and other organisations. The process was basically a subjective Delphi-like exercise involving the wide consultation of expert opinion. The main objectives were the protection of wildlife and landscape and the provision of access into the countryside. Other possible objectives such as the need to control food production, supplement farm incomes and control pollution were not such important considerations. There is clearly an opportunity to introduce some of these other objectives into the selection of target areas for land diversion and conduct the targeting in a more systematic way.

An attempt to do this has been made using a sieve-map, or potential surface analysis approach (McHarg 1969; Zetter 1974). A number of attributes for each of the three main objectives described above (mismatch, environmental vulnerability and conservation potential) were identified and then their presence, absence and/or relative extent in each 10 km square of the national grid was mapped (Table 6.3). The information was mostly digitised from existing datasets already on the 10 km base, notably that held by the ITE at Bangor and on the National Disc of the BBC Domesday package. In each grid square the number of attributes present were summed and the resulting scores mapped in different tones as if by overlay, or superimposition. The composite map (Figure 6.1) presents the results of this scoring exercise, with the darkest squares having the highest scores. No weighting of attributes was undertaken, though this is a refinement which the computer methodology can easily accommodate.

If it is accepted that those areas exhibiting more of the attributes are the most eligible for entry into a Conservation Reserve, then this map shows the target areas for such a programme. The map consistently highlights chalk and sandstone outcrops which are

Table 6.3 Attributes of the criteria for targeting Conservation Reserve land

'Mismatch'	*Environmental vulnerability*	*Conservation potential*
•Squares with over 30% crops and fallow by area, where over 25% Grade 4 land and less than 5% Grade 1 and 2 land	•Soils liable to wind erosion	•Presence of national natural reserves
	•Soils liable to water erosion	•Over 10% by area of deciduous woodland
	•Land liable to flooding	•Over 10% by area of moorland
	•Aquifer present	•Potential wetland (i.e. gley soils present)

		•Potential heathland (i.e. podzols present) •Potential calcareous grassland (i.e. rendzinas present)

picked out by a number of separate attributes. Many of these areas might be regarded as good, high-yielding arable land, but where production is at the expense of environmental pollution and habitat loss. Other potential target areas identified, such as Breckland, the North Norfolk coast, the Suffolk sandlings and the South Downs have already been selected as ESAs. It is interesting that other target areas lie next to or partially overlap with the boundaries of existing ESAs and some of the National Parks (see Figure 6.2). Another, perhaps

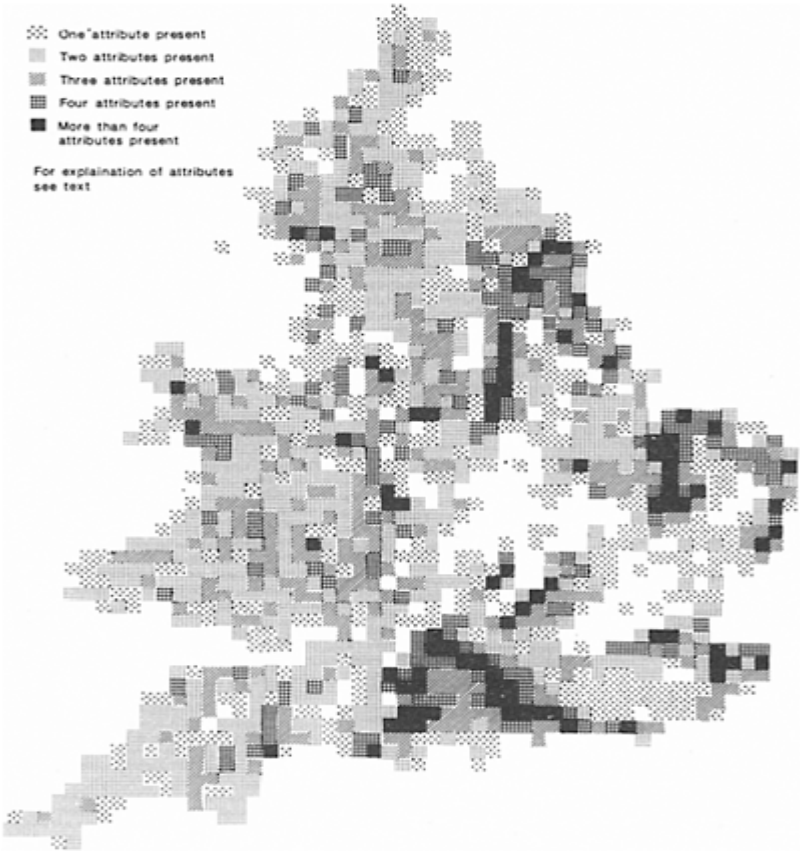

Figure 6.1 Target areas for a Conservation Reserve Programme

unexpected, target area is in the East Midlands, extending from Nottinghamshire to the area east and north-east of York. The potential here for land diversion in the Sherwood Forest and Derwent Valley areas needs to be explored. Table 6.4 summarises the land quality and land use characteristics of the 'target areas' identified. As can be seen, the land quality of the target areas is biased towards Grades 3 and 4 (68 per cent), compared to a combined England and Wales average of 56 per cent. Amounts of Grade 1 and 2 land are well below the national average (5 per cent

Figure 6.2 Environmentally Sensitive Areas in England and Wales

Table 6.4 The target areas by land quality grade and land use, as percentage of total area

	Land quality grade				
	1	2	3	4	5
Target Areas[1]	1	4	43	25	7
England and Wales[2]	2	12	40	16	11
	Land use				
	Wheat and barley		*Total grassland*	*Rough grazing*	*Woodland*
Target Areas	25		23	6	2
England and Wales	22		34	11	1

Notes: [1]Aggregated averages for twenty-four high-scoring 10km squares
[2]Taken from MAFF (1985c)

compared with 14 per cent). As might be expected from a procedure which highlights mismatched land, this breakdown is not reflected in the present pattern of land use within the target areas. The table also shows that cereais covered 25 per cent of the farmed area in 1984, which is above the England and Wales average of 22 per cent.

Land diversion strategies

Creating a Conservation Reserve would involve farmers in the target areas 'reserving' some or all of their land in perpetuity for the public benefit, taking land out of the production of surplus crops and putting it into a range of conservation uses tailored to their own circumstances and interests. The idea, and it would be a novel one for British farmers, would be for individuals to enter into long-term contracts with the state based on approved conservation plans. Payments would be given on a hectarage basis, either at a flat rate calculated by government officers or through a system of competitive bidding by farmers themselves (see Chapter 7). Farmers would be the prime agents of the Reserve Programme, but other landowners and developers could also be involved. One can envisage specific 'partnership' schemes such as the Countryside Commission's New Lowland Forest project being planned and executed within the framework of a Conservation Reserve.

A number of approved conservation uses of the land which is diverted by farmers can be envisaged. Planting with trees is perhaps the most obvious and recognisably commercial. Even without a Conservation Reserve, many experts now expect a significant expansion of lowland forestry on farms in the years ahead, especially in the remoter and wetter parts of the country where land values are expected to fall most steeply in response to cuts in farm support (Laurence Gould Consultants 1986). At the moment, the UK is much less heavily wooded than other European countries, 9 per cent of the land area being under trees compared to an EC average of 23 per cent. It is

estimated that ‘farm woods’ in the UK cover between 225,000 and 475,000 hectares (North 1988). MAFF estimates that a further 100,000 hectares of productive farmland could be given over to farm forestry (MAFF 1985b). Under the Farm Woodland Scheme, bridging payments to cover the ‘income gap’ between planting and harvesting are now available, with an annual planting target of 33,000 hectares. More ambitiously, the graphic image of forestry ‘moving down the hill’ suggests that extensive new lowland forests could be established following a decades-long emphasis on the afforestation of mostly upland countryside. The Countryside Commission is presently developing the idea of a ‘New Forest’ of some 40,000 hectares in the Midlands and elsewhere urban fringe forests around the major conurbations.

New forests could be promoted still more powerfully under a Conservation Reserve, where planting contracts would be given to farmers on a part or whole-farm basis within defined areas. Close attention would need to be given to species composition and to the silvicultural methods employed. Moreover, new forestry in this context need not necessarily mean planting trees or establishing new plantations. Abandoning well-chosen plots to allow natural regeneration to scrub and, eventually, high forest, could be an important feature of a Reserve. The area of land under scrub is typically regarded by agriculturalists as a pretty accurate barometer of farming fortunes, being high when times are hard and stock are withdrawn from the extensive margin. After decades of expansion, the barometer has an extremely low reading, so any planned increase in the extent of scrub can only benefit wildlife, providing important habitat for many birds. Allowing this scrub to succeed to woodland will produce woodland of greater variety and conservation value. As Rackham put it, ‘to prevent trees from growing calls for constant effort. Natural old-field woods…will be a much better habitat than plantations’ (Rackham 1988:24).

After forestry, the next most orthodox alternative land use is probably grassland. Since the war, the area of grassland in the UK has severely diminished, particularly in the arable south and east of England where specialisation has all but eliminated grassland from many cropping farms. This has led to declines in bird species such as lapwings due to a loss of nesting sites. Similarly, precipitous declines in barn owl populations may also be partly explained by the loss of grassland hunting areas (RSPB 1988). Most of the older grassland which remains is in upland areas where physical problems and/or economic returns have meant that the land has stayed in traditional uses. Remnants of grassland on lowland farms are increasingly scarce and fragmented (Hopkins 1988). Less grassland on such farms reduces accessibility, there being few more intimidating sights to a walker than uniform and featureless fields of wheat, with barely any unplanted headland. Reintroducing grassland onto specialised, arable farms would thus be to the benefit of access as well as wildlife. At the same time, it is thought to be one of the most effective ways of reducing the threat of nitrate pollution in underground aquifers (DoE 1986), provided that fresh ploughing of permanent pasture is also halted in vulnerable areas. This last idea is anticipated in the government’s decision to set up nitrate-sensitive areas in England and Wales (MAFF 1989).

Simply abandoning land to allow it to revert to climax vegetation is perhaps the most obvious but also the most controversial alternative use for land in a Conservation Reserve. In an essentially managed countryside dominated by plagioclimax vegetation, there is a great suspicion of any proposal to abandon land even, surprisingly, amongst conservationists. One reads of ‘dereliction’ and ‘scrubby fields’, always in pejorative

terms. Whilst it is undoubtedly the case that most heaths, moors, marshes, grasslands and haymeadows need some low-intensity agricultural management to maintain their ecological diversity and landscape values, these surviving habitats represent only a small fraction of farmland in most areas. Their natural succession to scrub and woodland would mean a loss of scarce habitats and species. But such changes at the expense of arable or intensive grassland would be an environmental gain. The cultivated margin has always moved according to the economic dictates of the times and some loss of land from farming in this latest recession seems inevitable, whatever means are employed to curb production. In the USA and in the tropics, vegetation succession on abandoned agricultural land is well known. Very few examples have been studied in Britain, but there are two at Rothamsted in Hertfordshire: the Broadbalk and Geescroft Wildernesses (Burnham 1989). Broadbalk Wilderness was abandoned in 1882 after thirty-nine years of unfertilised wheat growing. After twelve years, woody species (oak, ash, hazel, hawthorn and rose) had appeared. By 1913 it was dense thicket dominated by pedunculate oak, hazel, bramble and ivy and by 1945 it was visually semi-natural woodland with nine tree species. From 1894 woody plants were eliminated from half the original Broadbalk Wilderness by regular grubbing, thus creating Broadbalk Meadow. Species diversity in the Meadow has gradually increased (1886:40; 1894:49; 1913:65). In 1960 the Meadow was again divided, and the part nearest the wood has been grazed about six times a year with sheep. There are now very marked species differences between the grazed and the cut portion.

Geescroft Wilderness is larger and undivided, and was abandoned fifteen years earlier (in 1867). By 1913 all arable weeds had gone, replaced by grassland and scrub (Brenchley and Adam 1915). When species were enumerated on its centenary, fifty-five of the grassland species present in 1913 had gone, leaving tall oak, ash and elm woodland with a total of forty-six species of angiosperms. After a slower start the woodland is now taller than Broadbalk. The largest oak in 1967 was 206 cm in circumference. Both Broadbalk and Geescroft are on loam overlying clay-with-flints. Broadbalk has had a heavy dressing of chalk and remains near neutral; Geescroft has not, and the surface soil, originally near neutral (pH 6.0–7.0), has become acid (4.5–6.0). The Rothamsted Wilderness areas have proved to be of great scientific value. Tansley (1939) relied heavily on them when considering natural succession. Jenkinson (1971) used them in studies on the accumulation of organic matter in soils. Soil nitrogen, soil biomass and most recently acid rain studies have found samples from the Wilderness areas of pivotal comparative importance.

The difficulty which some conservationists have with ‘wilderness’ is not so much the idea as the scale on which it could be brought about; the setting aside of field corners and headlands to grass and scrub is accepted. But there is continuing concern that the *widespread* abandonment of marginal, chiefly upland countryside would accelerate the depopulation and decline of rural communities in such areas, with a loss of the cherished cultural landscapes that are actually maintained through farming. Wilderness as a conservation land use appropriately introduced at the field or farm level need not however conflict with this objective. Many overgrazed moorlands would benefit from the withdrawal of sheep, developing an improved heather cover as a result. The spontaneous regeneration of scrub and woodland is, as we have seen, a rapid and inexpensive way of establishing a stock of native broadleaved woodland. Equally, the flooding of land back

to fen and marsh could only add to natural diversity and interest in the countryside. Some of our best reserves, such as that at Minsmere, were originally abandoned farmland. In the United States, the most visited national park, Shenandoah, was thus created in 1936 and now boasts magnificent stands of hardwood forest. A similar reserve, rich in educational and scientific opportunities, could be created in Britain within a generation.

Finally, and most challenging, reserved farmland could be used to restore or create more specialised habitats like heathland, wetland and herb-rich haymeadows. Post-war countryside change has radically reduced these and other habitats in extent and quality; for instance, there has been a 41 per cent loss of lowland heathland and an 80 per cent reduction in lowland grasslands or sheep walks since 1940 (NCC 1984). Although the re-creation of these lost habitats is virtually impossible, a very great deal could still be achieved through a well-planned programme of creative conservation. Wet grasslands could be created by lowering drainage standards or by manipulating water tables, for example. The sward structure of species-rich grassland can be maintained through appropriate grazing regimes and stocking densities.

As well as the alternative use of the land, the scale and configuration of land diversion is also something which should be carefully planned. In principle, land could be taken out of agriculture around fields, within fields or over entire farms and used for a variety of alternative purposes. The matrix in Table 6.5 indicates some of the possible combinations. Merely leaving pesticide-free grass strips around arable fields is one of the simplest ways of softening the environmental impact of intensive farming (Way 1987). The concept of the conservation headland pioneered by the Game Conservancy (Potts 1986), is now regarded as one of the most effective ways of increasing numbers of weeds and insects which are vital in maintaining grey partridge populations. Allowing these same headlands to

Table 6.5 Elements of a UK Conservation Reserve

Scale	*Forestry*	*Grassland*	*Wilderness*	*Specialised habitats*
Headlands	Shelter belts	Mown or grazed grass	Abandonment leading to grass strips	Conservation headlands scrub and ‘tall, thick, wide hedges’
Fields	Small plantations and woodland	Permanent pasture on cereal farms	Weedy fallows and reversion to scrub	Creation of blocks of wet grassland, wet-land, heathland and herb-rich meadows
Farms	Afforestation, farm forestry	–	Wilderness areas	Heritage farming

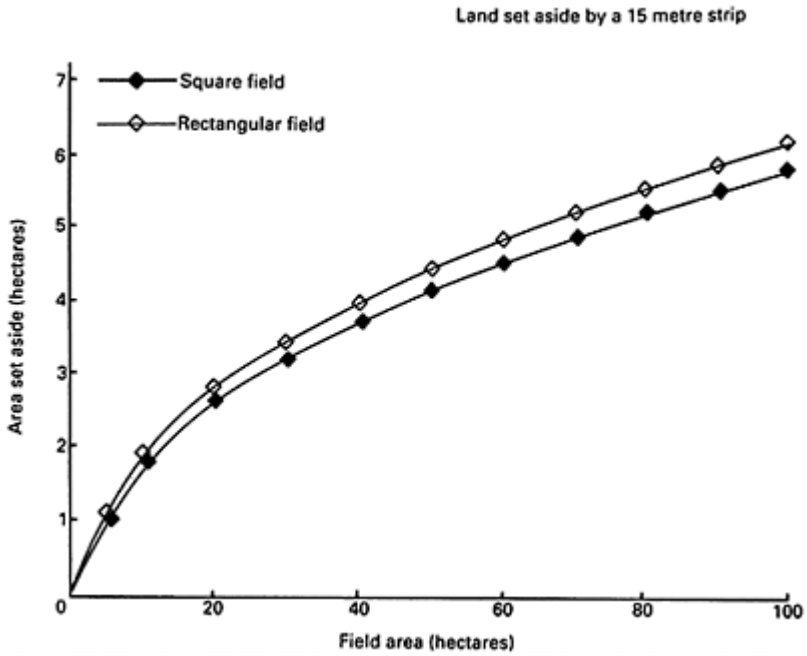

Figure 6.3 Conservation headlands: some conversions

revert to scrub and 'wilderness' around tall, wide and thick hedges would benefit a rather wider range of plants and animals. Our calculations (Figure 6.3) suggest that quite large areas of land could be reserved with strips of only a modest width.

The short-term diversion of discrete blocks of land in fields or parts of fields is what most people have in mind when they try to visualise set-aside. From the farmer's point of view, this configuration has the advantage that it allows him to enrol the most unproductive or troublesome land into a Reserve and to do so in ways which fit most easily into the existing farming rotation. Thus, there may be wetland arising from ponding hollows, springs or a high water table, which may make part of a field difficult to cultivate when the rest is ready, and in any case restricts flexibility of cropping and 'machinery work days'. Inconvenient fields with good soil may be difficult of access, e.g. only across several other fields or by traversing a steep slope or a stream.

Other fields may be very small or of an awkward shape. Where the removal of field boundaries would rectify this it has often been done, but sometimes the field is hemmed in between permanent limitations such as roads, streams, buildings or property boundaries. On many farms 10–20 per cent of the land is relatively poor or difficult to work, and makes comparatively little contribution to profit, even though there is substantial production from it. The fallowing of field or sub-field parcels, though not especially beneficial to wildlife on a large scale, could thus have a place within a Conservation Reserve. At a minimum, fields sown with spring cereals that are left unploughed in the winter months provide important foraging opportunities for many bird

species, while fields that are left fallow in the spring and summer would create many new nesting sites for birds. Under a Conservation Reserve it is unlikely that anything but ‘permanent’ fallow (i.e. more than five years) would be allowed; there is scope here for encouraging farmers to plant cover crops on erosion-prone fields or on land subject to environmental hazards. The creation of specialised habitat and the establishment of new woodland could both be undertaken at the field level. Finally, it would be a relatively straightforward matter to allow the interior of fields to revert to wilderness once seed banks had been built up along the headlands.

By comparison with these configurations, the idea of diverting whole farms is more difficult to envisage. Nevertheless, it is perfectly conceivable that under a Conservation Reserve which is implemented within the broad framework of a farm survival policy, some groups of farmers in particular locations, notably elderly or pre-retirement farmers in upland areas, could be persuaded to become farm foresters or heritage farmers. As such they would receive payments from the state to manage their farms and their complement of buildings, machinery and stock for the production of CARE goods or to turn all of their farmland over to woodland and forestry (Potter 1987). Unlike the ESA programme, which essentially maintains farmers who are already farming extensively, the aim would be to convert farms into environment-friendly farming systems by treating the entire holding as a block of land to be diverted. Clearly, this may involve a whole variety of alternative uses on different pieces of land—wilderness, woodland and specialised habitat. The notion of ‘heritage farming’ was first mooted as far back as 1970, when Franklin proposed that the ‘park keeper formula’ should be applied to keep marginal farmers in business. As he put it, ‘the general community will come to consider it worthwhile to support these for ecological and sociological reasons’ (Franklin 1970:55). Franklin described such heritage farmers in provocative terms as ‘wards of the welfare state’. Today the description seems less outrageous now that European socio-structural policy is coming more and more to resemble a farm survival policy. As has been seen, the principle of supporting farmers to produce countryside is already accepted and enshrined in the ESA programme. There is presently no shortage of likely candidates. According to one estimate, some 37 per cent of the UK farming population was aged over 55 in 1983, farming between them a total of 4.7 million hectares or 41 per cent of the utilised agricultural area (CEC 1983). On about a quarter of these farms it is thought that successors do not exist or cannot be persuaded to take over management.

Chapter seven
The view from the farm

The previous chapter has sketched in some of the essential features of a Conservation Reserve as it might operate in the UK. A question not yet considered is how farmers will react to being offered payments to plant trees, establish grass or create new habitat on productive agricultural land. Under a voluntary programme, the willingness of farmers in the target areas to enrol land and abide by the conditions laid down is crucial to success. With the retirement and diversion of land now more firmly on the agenda than at any time since Mansholt, farmers are already being invited to consider ways of using and managing land which are as novel and revolutionary as any to emerge since 1945. The pressing need to bring about reductions in agricultural capacity and to put in motion longer-term structural changes in the industry means that farmers accustomed to intensification and specialisation are now being urged to extensify and diversify farm production in order to survive. To farmers who have responded to past policy signals in the required manner, this must appear a surprising and contentious reversal of public policy. Since farmer behaviour cannot, under these circumstances, be predicted from past experience, a large question mark hangs over who the first participants in a land diversion programme will be and how much land they will be willing to enrol.

The question of participation

In the past, the adoption of new technological innovations in farming has been closely studied. Innovation-adoption models predict that the diffusion of a cultural trait through a farming population follows an S-shaped growth curve, which can be expressed as a bell-shaped distribution curve showing the frequency of adoption per unit time. Individuals can be classified according to their position in this distribution. Rogers (1962) used five categories: innovators, early adopters, early majority, late majority and laggards; terms which give a flavour of the underlying philosophy. Whether the adoption of land diversion by farmers can similarly be regarded as an innovation is a debatable point. From a review of literature, Gasson (1988) notes that research on the uptake of innovations in agriculture is dominated by the idea of advance, where adoption typically brings about increased productivity. The idea of treating the diversion of land as an innovation is difficult to square with this approach. Gasson, however, contends that any form of behaviour or type of activity is an innovation, regardless of content, provided it is

novel to the farmer. The individual who puts land into a Conservation Reserve is certainly departing from established agricultural practice; he is adopting a government scheme to divert land. In this respect it is vital that the enrolment of land into the Reserve is treated as an opportunity to be grasped rather than a constraint which stifles progress. Previous experience with the uptake of incentives for conservation suggests that much will depend on both the willingness of different farmers to divert land and their ability to do so in terms of resources and expertise.

These incentives, typically in the form of conservation grants, have largely been used to subsidise the direct costs of new conservation investment. Under its New Agricultural Landscapes projects, for example, the Countryside Commission (1987b) employed Project Officers to advise farmers and direct them to any grant aid that was available for conservation projects. The result was a highly uneven pattern of uptake, with most of the money going to subsidise conservation on farms with a history of interest and involvement in conservation. This supports Newby (1979) who argues that voluntary schemes appeal only to farmers who are already convinced conservationists, since these are the only individuals with the interest and expertise to take advantage of the grant available. It is a pattern that is repeated on a larger scale with the uptake of grants for agricultural capital investment on farms. As Bowler (1976; 1979) argues, the initiative for applying for most grant schemes lies with the individual farmer and involves him in effort and expenditure. It is thus inevitable that uptake is uneven. Capital is required to adopt the innovation, the investment is only recovered over a period of years, a degree of risk is involved and the grants have a different ‘utility’ for different types of farmers.

In recent years the type of conservation incentive on offer has begun to change, and with it the pattern of participation in country-side management. Under the ESA programme, a new constituency has been opened up, defined less in terms of promoting conservation investment and more in terms of maintaining traditional forms of land management. ESA payments are not grants but annual, flat-rate payments with a greater appeal to the small, typically livestock-based producers who predominate within ESAs. Land diversion payments under a Conservation Reserve programme would effectively extend this notion of paying farmers in order to prevent further intensification, purchasing the farmer’s right to keep some pieces of land in a productive agricultural use. They can be expected to appeal to another, perhaps more heterogeneous group of farmers, bringing about a further broadening in the pattern of participation in countryside management. But will the leaders in the field be the same farmers who have always shown their ability to react quickly and seize new opportunities, or will the initiative pass to those who were laggards before policy changed direction, who are already farming their land least intensively? These are important questions because the answers provide the key to the distributional as well as environmental impact of land diversion programmes.

The only available evidence on the voluntary uptake of payments to divert land comes from the United States, where it was found that participants were usually of the latter type. Under the Soil Bank scheme of the 1950s, land was enrolled in the greatest quantity by elderly farmers, farmers with off-farm jobs and those who, for various reasons, wanted to work less on the farm. A feature of the programme was that it tended to appeal to farmers who already intended to divert some of their land into ‘conserving uses’ (Brandow 1977). In the UK the advent of the set aside scheme has prompted much

speculation about the pattern of uptake. Harvey (1987) likens set-aside to another crop which the farmer can choose to produce, depending on its relative profitability and compatibility with an existing mix of enterprises. Harvey points out that farmers currently operating at their optimum scale in terms of labour, capital and other inputs per hectare, will not find it attractive to set aside cereal land as this will increase the level of fixed costs on the remaining area. For farmers with significant amounts of hired labour or borrowed capital, set-aside could be a sensible option: taking 20 per cent of land out of production might release one man and thus drastically reduce fixed costs. The most likely adopters will be those with insufficient labour and capital for their present farmed area. Harvey sums up the position by predicting that set-aside will be carried out by those who can afford to and those who 'can't afford not to':

> Those who 'can afford to' will use the schemes to do things which they could have done anyway and thus cost the Treasury and taxpayers money which need not have been spent. Those who 'can't afford not to' will be able to remain in the industry because of the schemes when they would otherwise have been forced out. In this case, the extensification schemes will be a disguised form of welfare or adjustment payment.
>
> (Harvey 1987:9)

A survey of farmers

So much for set-aside. A decision to put land into the Conservation Reserve can be expected to be a more difficult one in several respects, implying as it would a longer-term commitment to managing the diverted land for conservation purposes. Arguably, by requiring more radical shifts in land-use, land diversion will be less susceptible to the first of Harvey's implied criticisms—potential participants will find it harder to use the payments they obtain to subsidise land-use changes that might already have been planned. Whether payments under a Conservation Reserve become effective welfare payments is difficult to assess. In any event, the Reserve would be fulfilling part of its proper function if they did (see Chapter 3).

A survey of farmers within two of the target areas identified in Chapter 6 was undertaken in 1987 to provide some pointers as to participation in such a programme (Potter and Gasson 1988). One of the study areas was the Suffolk Sandlings, an area of very light, drought-prone sandy soils on the Suffolk coast. The other, part of the South Downs in West Sussex, has subsequently been given ESA status. The third sample was drawn from 1 km squares which had previously been identified by the Institute of Terrestrial Ecology (ITE: Barr *et al.* 1986) as experiencing some of the most marked landscape change in the period 1977–84. The sample squares were in land classes 10 and 11 (Benefield and Bunce 1982), the former representing valley floors or alluvial plains of well-farmed, mainly arable lowland country with many hedgerows and small woods, the latter alluvial plains or low, broad ridges of open landscapes with large, predominantly arable fields and hedgerows. Land class 10 is well represented in the north Midlands, north-east England and south-east Scotland, while land class 11 is more typical of the east and central Midlands. The squares selected for the sample were widely scattered,

ranging from north Wales and Shropshire through Oxfordshire, Northamptonshire and Bedfordshire to Lincolnshire, Yorkshire and Northumberland. The target was 50 completed interviews for each sample. The final tally was 145 with 47 obtained from the ITE sample, 50 from Suffolk and 48 from the South Downs.

Each respondent was presented with three hypothetical types of land diversion: first, a simple set-aside in which they would be required to merely fallow cereal land for up to two years; secondly, a more sophisticated grassland scheme, which would require putting cereal land into a conservation grassland use for up to five years and finally, a woodland scheme, where they would be paid to plant arable land to deciduous trees. Two pieces of information were obtained from each farmer in these study areas. Respondents were asked to indicate how much land they would consider putting into each of these schemes. They were then asked to estimate a rate of payment (per hectare) which they felt would give them a sufficient incentive to enrol this much land.

The results of the survey offer some important insights into how a voluntary programme could actually work. As Figure 7.1 indicates, most of the ‘money bids’ for putting land into each of the three

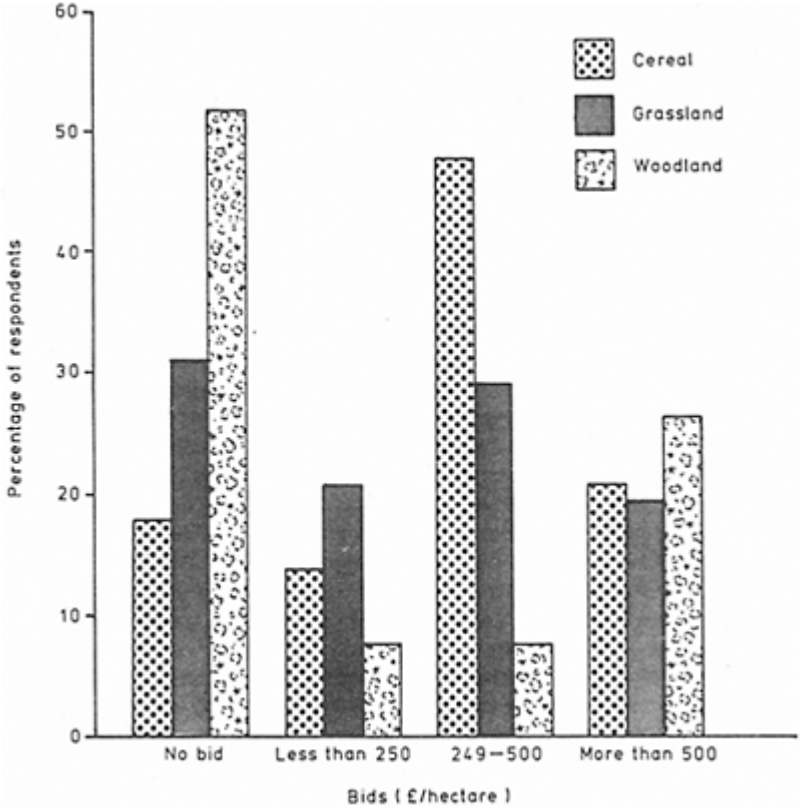

Figure 7.1 Projected participation in land diversion schemes

schemes, were in the 100–200 per acre range (£250–500 per hectare). On this evidence, farmers would need to be offered an average of £141 per acre (£348 per hectare) to fallow cereal land, £136 per acre (£336 per hectare) to divert arable land into permanent pasture and £177 per acre (£437 per hectare) to grow broadleaved trees (assuming that planting costs had already been covered), all amounts are well in excess of the payments now on offer to farmers under the set-aside scheme described in Chapter 3 above (see Table 3.2, p. 37). This is, on the whole, what might be expected, with the highest payments being required to persuade farmers to participate in the most long-term, restrictive scheme, although the suggestion that higher incentives are needed to attract farmers into the one—or two-year cereal scheme compared to the five-year grassland scheme is somewhat inconsistent.

Collectively the farmers interviewed were prepared to offer some 1,800 hectares for the cereal scheme, equivalent to 10.4 per cent of their combined cereal hectarage in 1987 or 5.9 per cent of the total area farmed (31,010 hectares). A total of 1,400 hectares was forthcoming under the grass land scheme and 300 hectares only under the woodland scheme. Not all those who were willing to participate actually specified the area they would enrol. It is therefore more realistic to relate the mean area offered under each scheme by those prepared to participate to the mean farm size. On this measure the sample as a whole was prepared to enrol about 7.5 per cent of available farm land in the cereal and grassland schemes and 3 per cent in the woodland scheme. They were thus only prepared to consider participating in land diversion schemes to a very limited extent.

A few, however, expressed interest in setting aside the whole farm and pursuing some other occupation.

Willingness to participate

The willingness of farmers to enrol land and abide by the conditions laid down is likely to be an important feature of a Conservation Reserve. In this respect, a smaller hectarage willingly given may be better than a larger hectarage grudgingly enrolled. The survey results reveal that some farmers who would be unwilling to enrol land unless forced to do so, still recorded a money bid and specified an acreage figure. These ‘bogus’ bids distort the picture given in Figure 7.1, possibly exaggerating the response which might be anticipated in a real scheme. To try to correct for this effect, each respondent was scored for each scheme as follows:

1 willing, keen, interested, prepared to consider joining;
2 neutral, no comment, discussed only practical details;
3 unwilling, would join only under compulsion, strongly opposed;
4 no reply (not necessarily unwilling but not eligible or cannot suggest a figure).

Table 7.1, based on these categories, adds a dimension of realism to the message conveyed by Figure 7.1. In each case willing respondents offered the most land and asked for less than the average valuation in return. Those unwilling to participate offered the least land, although they did not submit higher bids. (For the cereal and grassland schemes, acres offered differed significantly according to willingness to participate.) Comparing the three schemes on this basis, the woodland alternative emerges as the least

popular, with 61 per cent of those questioned unwilling to participate as against 17 per cent and 26 per cent under the cereal and grassland schemes respectively. The last two elicited more neutral and non-committal responses, possibly reflecting the difficulty of specifying, during a brief interview, how these schemes would work in practice. The woodland scheme was perhaps more easily visualised and may have evoked a more categorical response on this account.

Other reasons for the unpopularity of the woodland scheme were

Table 7.1 Farmers' willingness to participate in schemes

Willingness	*No. of farmers*	*Mean bid (£/ha)*	*Mean offer (ha)*
Cereal Scheme			
Willing	21	345.8	28.8
Neutral	77	350.5	15.4
Unwilling	25	329.0	7.7
No reply	22	–	–
Total sample	145	347.0	16.3
Grassland Scheme			
Willing	18	293.4	29.3
Neutral	62	326.8	13.2
Unwilling	38	274.9	4.6
No reply	27	–	–
Total sample	145	336.7	15.9
Woodland Scheme			
Willing	182	98.4	9.0
Neutral	940	0.6	2.6
Unwilling	895	35.3	2.2
No reply	29	–	–
Total sample	145	436.7	7.1

not hard to find. Some thirty-three respondents voiced the widely-held belief that planting trees on farm land was too long-term with many smaller farmers pointing out that this would reduce flexibility and their ability to respond to new opportunities. Many objected in principle to the diversion of 'good' land in this way; some indicated that they would not be averse to seeing trees on someone else's farm! A few expressed concern at the impact of a large proportion of woodland on the market value of their farms. Tenants stated that decisions about planting trees could only be taken by the landlord; on some estates any woodland area planted by the tenant would be taken in hand by the landlord.

Finally, some farmers felt that their lack of manpower, experience or relevant skills in forestry would hinder participation in such a project.

Who are the participants?

These results suggest that, because of systematic variations in willingness to adopt land diversion schemes, a voluntary programme will inevitably discriminate in favour of some types of farmers and against others. Table 7.2 shows, for instance, that Suffolk farmers in general asked for the most money and offered the least land, with the mean number of hectares enrolled under the cereal and grassland schemes being notably lower than the sample mean. In four cases out of six the differences were statistically significant. South Downs farmers, on the other hand, were prepared to enrol more land for lower payments and again, four out of six differences were significant. The difference was greatest for the woodland scheme: the average bid of South Downs farmers of £161.8 per hectare was very significantly

Table 7.2 Mean bids and areas offered by sample area

Sample	*Mean bids (£/ha)*			*Mean offer (ha)*		
	Cereal scheme	*Grassland scheme*	*Woodland scheme*	*Cereal scheme*	*Grassland scheme*	*Woodland scheme*
ITE	337.7	263.8*	388.7	6.8	6.35	1.58
Suffolk	364.8	423.6*	525.9*	2.6‡	2.63‡	1.50
South Downs	321.1	232.0*	161.8*	13.8†	14.20*	10.80
Total sample	347.0	335.7	436.7	6.6	6.40	2.90

Notes: Differences between individual and overall means were tested for statistical significance using the t-test, two-tailed
*significant at 5 per cent level
†significant at 1 per cent level
‡significant at 0.1 per cent level

Table 7.3 Mean area offered by farm size

Farm size (ha)	*Mean offer (ha)*			*Mean offer as % of mean farm size*		
	Cereal scheme	*Grassland scheme*	*Woodland scheme*	*Cereal scheme*	*Grassland scheme*	*Woodland scheme*
Under 100	4.6	4.6	1.4	9.5	9.4	2.8
100–250	13.2	11.7	3.2	8.1	7.2	2.0
250 and over	36.1	36.8	19.4	6.8	7.0	3.7
Total sample	16.3‡	15.9‡	7.1‡	7.6	7.4	3.3

Note: ‡Significant at the 0.1 per cent level

below the sample mean of £436.7 while the average area offered by those willing to participate in the scheme was nearly four times the sample mean. Responses from the ITE sample were in every case closest to the overall mean, suggesting that this geographically scattered group can be regarded as a control sample.

As expected, there was a highly significant association between farm size and the area offered under each scheme (Table 7.3). The mean area offered by farmers prepared to participate represented a decreasing proportion of the land available as farm size increased, except for the woodland scheme where the largest farms offered a bigger share of their available land than the rest. The level of money bids, however, did not differ significantly between farm size groups. For this reason most of the following tables use *area offered* as the measure of participation. Farm type was *not* found to be a powerful predictor of participation in the land diversion schemes, though mixed farms were inclined to enrol more land than either pure arable or pure livestock types, the area offered under the grassland scheme being significantly higher than the sample mean. This could be partly an effect of farm size, since the mixed farms in the sample tended to be the largest and therefore had the most land at their disposal. A ‘selectivity effect’ may also be at work here since mixed farms can more easily adjust their enterprise mix than specialised units.

As far as the characteristics of the farmer and family were concerned, no regular pattern of variation in bids or area offered could be found according to the farmer’s age, background or education. Some differences emerged in respect of stage in the family cycle, however. Farmers in the middle stage, with working-age children living at home, offered significantly more land under the cereal and grassland schemes than others. This may once again have been a farm size effect since these farmers tended to have the largest farms. More relevant for policy purposes was the discovery that farmers aged over 55 who had no successors for the farm business were prepared to accept below-average payments to enrol land in the cereal and grassland schemes and to offer larger than average amounts of land for the woodland scheme. This was *not* a size effect since this group farmed less land, on average, than those with definite successors or those where the

succession had not been decided. Farmers like these might be receptive to the EC proposals linking set-aside to early retirement (CEC 1987b).

Resistance and adoption

Clearly, resistance and adoption factors, if they operate at all, must be related to more complex farmer and farm business characteristics. Munton, Eldon and Marsden (1987) believe that any understanding of adoption needs to take account of the economic status of the business. They predict that so far as the uptake of set-aside is concerned, 'accumulators' (businesses which have increased in size and profitability since 1970) can be relied on to exploit any new scheme to the full, provided the financial rewards are sufficiently attractive. 'Survivors' (businesses that have generally succeeded in making a profit but which may be under pressure from debt or other factors) might be attracted into a scheme, provided that resources like labour can be released for other gainful activities on or off the farm. 'Marginalised' businesses, however, will tend to be unwilling to risk participating in a set-aside scheme without 100 per cent compensation being guaranteed. Munton *et al.* believed that such farmers would be least informed and least able to work out the full economic consequences of participating.

The findings of the present survey supported these predictions. Those farmers with the largest and most profitable businesses and those in the strongest liquidity position, corresponding to 'accumulators', were most responsive to the idea of diverting land out of cereals. Table 7.4, which shows the relationship between the level of constraint facing a business in terms of debt, scope for diversification and expansion of existing enterprises, and hectares offered, indicates that participation in all three schemes is inversely related to the level of this constraint. The best-placed and most 'enabled' farmers consistently submit the most acres under all three schemes. Although this is partly explained by a positive correlation between farm size and enablement, the table also suggests that enabled farmers are actually more willing to participate than more constrained individuals. Rates of payment which would gain the participation of enabled farmers were not, how ever, significantly different from those of more constrained operators.

This suggests that if hectares were accepted into a Reserve on a 'first come first served' basis the lion's share of the land diversion budget would tend to go to those businesses best placed to weather any policy change. The important policy implications of this finding are discussed below. It would appear that, far from regarding a land diversion payment as a useful additional source of income, constrained farmers fear the lower returns, reduced flexibility and increased bureaucracy that would most probably accompany any diversion of land out of productive use. A more cogent but not necessarily inconsistent explanation is that enabled farmers are more likely to be active adopters of land-diversion schemes, possibly because they can foresee a specific advantage in participating.

Table 7.4 Mean area offered and willingness to participate in schemes by level of constraint

Level of constraint	*Mean offer (ha)*			*Percentage willing or neutral towards scheme*		
	Cereal scheme	*Grassland scheme*	*Woodland scheme*	*Cereal scheme*	*Grassland scheme*	*Woodland scheme*
Severe	11.2	6.9	1.4	56.5	56.5	13.0
Moderate	11.2	9.9	2.6	69.4	49.0	16.3
Enabled	26.7	29.7	15.5	76.0	60.0	26.0
Total sample	16.3‡	15.9‡	7.1‡	67.6§	55.2§	18.6§

Notes: ‡The association between level of constraint and mean area offered was significant at the 0.1 per cent level, using one way analysis of variance
§The association between level of constraint and willingness to participate was *not* significant at the 5 per cent level, using Chi-square

The motives of participants

An analysis of the reasons for willing participation given by respondents supports this last hypothesis. It was discovered that the most eager participants were those who envisaged using the payments received under the various schemes to further a conservation or forestry project which had already been planned. Typically, this might involve using the cereal scheme to pay for a widening of headlands or the setting aside of a block of land. Certainly there was a positive association between a respondent's conservation score, a measure of his past involvement in conservation activities, and his willingness to participate in the scheme. Moreover, the conservation orientation of farmers proved to be significantly associated with the level of financial constraint under which they were working, those subject to the least constraint scoring highest on the conservation scale.

A typology was developed which tried to explain farmers' responses to hypothetical incentive schemes for diverting farm land to conservation uses. One dimension was the level of financial constraint or liquidity as reflected in farm size and profitability, the level of fixed charges, indebtedness and the existence of other sources of household income. The other was the farmer's 'conservation score' based on evidence of past investment in conservation works on the farm, expressed attitude, use of professional advice and plans for the future. The following is a typology of farmers related to conservation behaviour:

1 *Higher financial constraint/lower conservation orientation* Small-scale, low income or heavily indebted farmers who are neutral or antagonistic to conservation or at best show a weak positive attitude, but in any case cannot afford to invest in conservation projects.

2 *Higher financial constraint/higher conservation orientation* Farmers who are positive conservationists but prevented from achieving more by the small size or low profitability of their farms.
3 *Lower financial constraint/lower conservation orientation* Farmers under little financial constraint who may see a conflict between conservation and farming, or who do not choose to invest more than a minimal amount.
4 *Lower financial constraint/higher conservation orientation* Committed conservationists with the means to pursue their interest.

Group 1 accounted for nearly half the 145 farmers interviewed but for only one-sixth of the area. Only 20 per cent of the farmers were in Group 4 but they farmed over half the land. The typology helped to explain farmers' responses to the hypothetical schemes. Group 4 farmers, who were under less financial constraint and who expressed more positive conservation attitudes, were the most willing to participate in all three land diversion schemes and offered the most land in each case, with average money bids always below the sample mean.

The selectivity effect

These findings suggest that some Group 4 individuals were attracted to the schemes because they offered the prospect of being paid to do what they would have done anyway. Conversely, certain conditions attached to the proposed schemes may be unacceptable to other farmers who are nevertheless both willing and able to make the desired changes in farming practices. It was not possible to pursue this line of argument in the present survey since few scheme conditions were specified. Even so there were hints of what might be called a 'selectivity effect' at work, where farmers take up land diversion payments to carry out changes that had already been planned. Respondents with mixed farms were more inclined than all arable or all livestock producers to entertain the idea of diverting part of their cereal acreage to permanent pasture. The selectivity effect showed up more clearly in relation to the woodland scheme. Among potential participants the mean area offered was 7.1 hectares. Those who had woodland on their farms offered 10.4 hectares and those who had shown some readiness to plant, clear or otherwise manage their woodlands over the past ten years, 13.8 hectares, which was significantly more than the sample as a whole.

If the selectivity effect helps to explain farmers' willingness to enrol in the woodland scheme, does it explain reactions to the other schemes? Do farmers who are contemplating reducing their cereal acreage, increasing the area of grassland and shifting to a more extensive grazing regime see land diversion payments as a useful way of subsidising these changes? Respondents were asked how they would react if cereal prices were reduced to below £80 per tonne. Here the largest number (49 per cent) said that they would maintain the present cereal acreage, a further 35 per cent would replace some of their cereals with other crops and 12 per cent would give up growing cereals altogether. Nearly half of those answering the question would therefore be in a position to make cereal set-aside work to their advantage within the framework of existing plans. No significant association could be found, however, between farmers' reactions to falling prices and their participation in the cereal scheme. The Suffolk farmers were asked how

they would respond to the scheme if the cereal price dropped below £80 per tonne. While twelve raised their bids, nineteen lowered them and nineteen registered the same bid as before. Most thought they would still offer the same amount of land.

The cost of set-aside

Asking farmers for 'bids' mimics to a certain extent the procedure adopted in the USA, where, rather than government setting a rate of payment, farmers themselves compete or bid for some of the money on offer. Sealed bids are submitted to the USDA which specify the rate of payment which a farmer would be prepared to accept in return for participating in the programme. On the appointed day, the envelopes are opened and bids compared, the most competitive bids being accepted first. Although there are pitfalls with this approach,

Table 7.5 Cost of schemes using sealed bids and flat rate payments

Level of payment (£/ha)	*Area offered (ha)*	*Total cost (£)*	
		sealed bids	*flat rate*
Cereal scheme			
247	528	85,460	130,500
308	1,030	218,335	318,000
370	1,318	323,775	488,400
494	1,410	364,190	696,600
Grassland scheme			
247	711	89,329	175,700
308	967	159,529	298, 750
370	1,061	192,549	393,000
494	1,070	196,689	528,800
Woodland scheme			
247	94	10,690	23,200
308	15	27,710	48,875
370	171	32,360	63,300
494	171	32,360	84,400

one would expect a sealed-bid system to save money because it eliminates the possibility of some farmers receiving windfall gains over and above the rate of payment which would have secured their participation. Table 7.5 draws on survey results to show how

much could be saved under a system of competitive tendering. To take the cereal scheme as an example, respondents were prepared to enrol some 528 hectares (1305 acres) for bids of up to £247 per hectare. At a flat rate that would cost £130,500 whereas the sum of bids amounted to only £85,460. If the rate were set at £308 per hectare, some 1,030 hectares would be forthcoming at a cost of £318,000, whereas only £218,335 would need to be paid under competitive tendering. Clearly even with these small numbers, it could be argued that the sealed-bid system would enable the money available to be spent to best effect.

The policy implications

In one sense, the view from the farm revealed in these survey results suggests some difficulties in creating a Conservation Reserve based on voluntary participation. Respondents demanded relatively high levels of compensation to enrol comparatively meagre amounts of land. The areas of land offered under the cereal and grassland schemes were particularly modest, amounting to no more than 7.5 per cent of the farm land available. For the woodland scheme, only about 3 per cent of eligible land would, on these results, be forth-coming for diversion. These levels fall well short of the 20 per cent minimum enrolment required under the extensification scheme (see Chapter 3) and would hardly produce the sort of land use changes envisaged in Chapter 6. The survey findings also suggest that participation in a Conservation Reserve would tend to be limited to farmers running well-managed, established businesses with an interest in conservation or forestry. It would be difficult to gain the commitment of more constrained and marginalised farmers, the implication being that voluntary schemes may not be very successful in instigating land-use changes on farms without a past history of conservation, though they may improve and extend the conservation effort on farms already committed to good conservation practice. This conclusion is strengthened by the finding that resistance to land diversion was greatest among those actively opposed to or indifferent towards conservation on their farms, and for those who would find it most difficult to square a reduction in the farmed area with present farming practices and the existing burden of fixed costs. Contrary to expectations, this group asked for most compensation to enrol the least land; as ‘resisters’ they would be the most grudging participants in any scheme and the last to join if given the choice.

Some encouragement can nevertheless be taken from the fact that these survey results, obtained before the present set-aside scheme was even in operation, offer only a snap-shot. They present a static picture of likely farmer participation in a Conservation Reserve and ignore how the rate and pattern of ‘adoption’ could change once other, wider market policy changes begin to take effect. The income situation facing many farmers is deteriorating so sharply that attitudes towards land diversion may already have altered. Putting land into the Conservation Reserve could become a sensible part of a farmer’s survival strategy when times are hard and the opportunities for diversification limited. Under such circumstances, the very farmers who, in the survey, exhibited the most resistance (small, marginalised businesses and those constrained by debt and family obligations) would be drawn into a land diversion programme in increasing numbers. The challenge will be to ensure that such farmers are trained in the ‘new conservation’ which

land diversion entails and encouraged to regard participation as an innovation in farming practice. The diversion of land in the carefully prescribed sense defined here is a far cry from merely setting land aside. But the conservation returns are immeasurably greater.

Chapter eight
The new conservation

An attempt was made at the start of this book to define the wider possibilities open to policy-makers as they set about reforming policies that affect the use and management of rural land. Many years of land-saving technological progress in farming, coupled with a long-term stagnation in the demand for food and fibres, means that certain degrees of freedom are now available. These should permit a more spacious and imaginative use of rural land than ever before. The 'large project' is to redistribute the fruits of past technological change by redeploying the excess land, labour and capital that is presently fixed in a farming use to benefit all users of the countryside. This will involve some combination of an extensification of production and the diversion of land out of agriculture altogether. The question was asked: if the need is to reduce agricultural over-production, then can this be achieved in ways which keep conservation to the fore? It would be ironical indeed if environmental concerns were to be just as effectively pushed to the margin by contraction as they were by expansion. In the past such a direct and simple question was rarely posed. Policy-makers, preoccupied with the need to reduce over-capacity to solve pressing budgetary problems, have only recently begun to think more clearly about longer-term agricultural restructuring. Now that they have, the way is open to move some way towards ensuring that agricultural surpluses are translated into environmental opportunities. But the approach is more oblique than the 'large project' defined above might suggest.

To begin with, socio-structural policy itself, one of the main instruments for restructuring the industry, has recently come closer to resembling a policy for farm survival than one of liquidation. For a variety of ingrained cultural and political reasons, there is an extraordinary commitment to maintaining farmers on the land which often pre-dates and runs deeper than environmental concern in many member states. This sets limits to the scale and extent of any redeployment that can realistically be expected to take place. According to the European Commission's document *A Future for Rural Society* document (CEC 1988), restructuring is about managing change and diversifying the rural economy and the pattern of land use, not the removal of farmers and the abandonment of land. It will mainly take place within individual farms through extensification, conversion and diversification and will rarely require any more radical restructuring. More explicitly, a new generation of direct income aid schemes is being developed and implemented under this farm survival policy which will actually

underwrite the continued existence of some vulnerable farmers in certain locations, albeit in a form better adjusted to the new market realities.

It is this farm survival policy rather than a more grandly conceived strategy which sets the framework for any diversion of land that will be carried out. One could argue that this takes away some of the freedom of action which policymakers have available to them. The presumption that farm structures must be left more or less intact, and indeed actually preserved in some areas, clearly rules out a new Mansholt Plan and the large-scale diversion of land which it implies. Some will regret the imposition of such a constraint in the belief that it is only by changing farm structures and releasing large amounts of land from agriculture that the environmental opportunities of over-production can be realised in full measure.

Others, probably the majority, will recognise that a farm survival policy creates its own distinct opportunities for conservation. It is already becoming clear for instance that environmental protection itself is coming to define a range of activities which farmers can carry out in order to qualify for income aid and so remain in business. Provided it favours environmentally strategic farmers, a farm survival policy could be used to contract whole sections of the farming community into the production of CARE goods. Certainly there is a strong principle of reciprocity running through the new generation of socio-structural schemes, well illustrated in the ESA programme. Farmers are offered compensation and income aid but in return they are expected to make their farming practices environmentally sensitive. To the extent that the terms of this exchange or contract are still being worked out for particular farmer groups and in certain parts of the countryside, the scope for managing agricultural adjustment in environmentally sensitive ways remains very considerable.

The very existence of a European farm survival policy challenges British conservation in a practical and philosophical way. Philosophically, it is a restatement of the thinking which followed the Mansholt Plan, with its categorical rejection of a European agriculture patterned on the US, with ‘few farmers and large resources of land’. Practically, it suggests that the pattern of participation in conservation by the farming community will change as some farmers are recruited into conservation for the first time. The emphasis in the past has been on encouraging farmers, usually the progressive and enlightened ones, to spend more on conservation projects by offering them grants and advice. Now, with the ESA programme and the prospect of other direct income aid schemes, it is the laggards in agricultural modernisation who are emerging as the target group for a form of contract conservation which links environmental protection to the support of vulnerable or endangered farmers. Laggards find themselves in the best position, precisely because of their laggardness, to take advantage of the extensification-related measures that are being introduced. Their recruitment means that conservation will become a means of earning a livelihood, not merely a form of investment which can be carried out only by farmers who can afford it.

The other, more immediate implication of a farm survival policy is that determined and concerted efforts will be made by government to ensure that extensification, diversification and conversion is undertaken by the large number of farmers who remain in existence. The diversion of land is likely to feature prominently. In this book it has been argued that since a farm survival policy dictates that land will only be diverted at the farm level, an attempt should be made to ensure that this is undertaken for long enough

periods and in the right locations to maximise conservation benefits. A Conservation Reserve should be established by co-ordinating and targeting the diversion of land on the nation's farms. Long-term contracts should be offered to divert land now in intensive agriculture into conservation grass, trees, wilderness or more specialised habitat. A Conservation Reserve of this type offers one of the most powerful ways of extending the social contact between farmers and the state, adding appreciably to the present conservation estate and enhancing conservation value in the 'wider countryside'. As a voluntary programme, its success depends, in the first instance, on the willingness of farmers to put land into the programme. Attitudes towards land diversion are already changing rapidly, though it may require further declines in the general profitability of farming for widespread adoption to be achieved.

Should it be created, a Conservation Reserve would require new thinking by conservationists about how the creation or restoration of habitat and landscape should be related to the traditional concern with defending and protecting what already exists. There are difficult ethical as well as practical issues at stake here which are still barely recognised in public debate. There is also a question of strategy. According to Moore (1987), conservation will always be characterised by a dual strategy of setting aside and designating special areas where conservation is the primary land use and of attempting to integrate conservation with land use on the land which lies outside the Reserve. The expansion of agriculture has meant that, in the past, nature conservation has been firmly tied to a site safeguard approach (NCC 1984). The reality has fallen a long way short of the vision which the founding fathers had of a 'unified code (of conservation) for the whole country'. A Conservation Reserve, while it appears to commit conservationists more to the first than to the second of these approaches, need not preclude a more widespread extensification of production when the time (and the technology) is right. Certainly there can be no more powerful and immediate way of creating 'new landscapes' than through the carefully directed programme of land diversion which a Conservation Reserve represents.

Even without a Conservation Reserve, everything now points to broad shifts in the scope and thrust of conservation in the UK. Already, with CAP reform and the deeper meshing of environmental and socio-structural concerns that underlies most of the trends noted in this book, conservation issues are being drawn into the wider and quintessentially European debate surrounding farm structures and 'rural life', a development that will introduce new prejudices and assumptions. Much depends on how well the concerns of member states like France and Germany with rural desertification and the prevention of social decline (Nowicki 1988) coincide with the typically British but also Dutch and Danish concern with the conservation of farmed landscapes. The talk is increasingly of 'rural society' rather than countryside and of 'rural development' rather than 'conservation'. Conservationists in the UK will be required to think more systematically about how the survival of certain types of farmer will further their objectives and of whether target groups can be said to have conservation potential as well as pieces of country-side. The diversion of land may be just the visible manifestation of a new conservation that is more widespread, positive and managerial than ever before.

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