executive summary

1 Countryside Survey 2000 (CS2000) and the Northern Ireland Countryside Survey 2000 (NICS2000) have been designed to provide detailed information about the habitats and landscape features that are important elements of our countryside. They can tell us about the 'stock' of these resources, that is how much of them we have and where they are to be found, and they can give us an insight into their condition based on the variety and abundance of the plant species associated with them. Using information from previous surveys, we can also gain an understanding of how the stock and condition of these habitats and landscape features are changing over time. We can build up a sort of balance sheet or an account of natural assets in the UK countryside. In this report we look in particular at the period between the last two surveys, 1990 and 1998.

2 The information collected can be presented in various ways because it is held in flexible, computerised databases. In the light of the importance of the UK Biodiversity Action Plan (BAP), and the Government's requirement to report on biodiversity at the turn of the Millennium, the results are presented in this report in terms of Broad Habitats, as used in the BAP. However, the results also update two of the Government's *Quality of Life Counts* (QOLC) indicators on landscape features and plant diversity.

3 The QOLC indicator for landscape features – hedges, walls and ponds – shows that in Great Britain the declines in lengths of hedges and walls reported for the 1980s have halted. In the case of hedges in England and Wales, there is some evidence that losses in the early 1990s have reversed. Lowland ponds show a small net increase. However, in Northern Ireland the stock of hedges and earth banks declined between the early 1990s and 1998.

4 The QOLC indicator for plant diversity shows that many of the deleterious changes in species richness recorded in Great Britain in the 1980s have reduced in magnitude or halted. Declines in species richness in the 1990s are mostly associated with the vegetation found in managed agricultural grasslands, field boundaries and verges. The continued decline in the diversity of our least agriculturally improved grasslands is a matter of concern. There have also been marked trends in the condition of vegetation indicating increasing levels of nutrient availability – or eutrophication – and conditions which favour tall, competitive plants.

5 The general conclusion from these very broad national indicators is that negative trends in some key components of countryside quality have slowed or halted during the 1990s. The more detailed assessment of Broad Habitats which follows shows how these general trends apply to different features in different parts of the UK. A summary of the 'headline results', which illustrate the main findings is given in Box 1.

Enclosed farmland: Arable and Horticultural, Improved and Neutral Grasslands

6 *Arable and Horticultural* and *Improved Grassland* are the most extensive Broad Habitats in the UK. Their stock has changed little between 1990 and 1998, although small proportions were converted to woodland or developed land. There is some evidence for increasing plant diversity in the *Arable* Broad Habitat, especially in the margins of the fields. Such habitats were very species-poor in 1990 and these changes may reflect rotations between crops and sown ley, as well as managed set-aside and creation of uncultivated headlands and field corners. In *Improved Grassland* plant diversity has declined since 1990. Other changes in the

Box 1: Ten 'headline results'

1. Plant diversity increased in arable fields, especially in the boundaries of the fields. Plant diversity in some arable field boundaries in England and Wales increased by 38%.
2. Plant diversity continued to decline in the least agriculturally improved grasslands in Great Britain. Plant diversity in some meadows fell by 8%, including losses of meadow species important for butterflies. The area of 'neutral' grassland in Northern Ireland decreased by 32%.
3. Following marked losses in the 1980s, there was no significant difference in the 1990 and 1998 estimates of hedgerow length in England and Wales. There is some evidence that losses in the early 1990s have been reversed.
4. Road verges showed evidence of increasing nutrient levels and losses in plant diversity. Plant diversity fell by 9% in some road verges in England and Wales.
5. Broadleaved woodland expanded by 4% in England and Wales and 9% in both Scotland and Northern Ireland between 1990 and 1998. The total area of coniferous woodland in the UK was unchanged.
6. The area of semi-natural 'acid' and 'calcareous' grasslands fell by 10% and 18% in the UK. The area of bog fell by 8% in Northern Ireland. There was evidence of increasing nutrient levels or eutrophication in dwarf shrub heath and bog, suggested by an increase of plant species more typical of lowland grasslands.
7. The number of lowland ponds increased by about 6% between 1990 and 1998 in Great Britain.
8. The biological condition of streams and small rivers improved in Great Britain. Over 25% of sites improved in condition and only 2% were downgraded.
9. Streamside vegetation became more overgrown, and plant diversity decreased by 11% in England and Wales. Fen, marsh and swamp expanded by 27% in England and Wales and 19% in Scotland but declined by 19% in Northern Ireland.
10. More broadleaved woodland was created on formerly developed land than was lost to new development in Great Britain in the 1990s.

vegetation indicate that nutrient levels have increased over the same period.

7 *Neutral Grasslands*, which include some species-rich hay meadows as well as areas of unmanaged grassland, cover less than 4% of the UK. These grasslands show losses in stock in Scotland and Northern Ireland but gains in England and Wales. Overall 13% of *Neutral Grassland* was primarily converted to *Arable, Broadleaved* or *Built-up* Broad Habitats between 1990 and 1998. The floristic character altered, with increases in tall, competitive plants at the expense of more typical meadow plants.

8 The analysis suggests that, whilst little change has taken place on already intensively managed arable land, the stock and condition of surviving parcels of less improved grasslands has diminished. These changes are associated with the declining frequency of typical meadow flowers and grasses, and may reflect increasing fertility levels in these habitats. Since these parcels of 'infertile' grassland have a higher conservation value than intensively managed grasslands, these changes may represent a decline in the overall quality of the grassland habitats associated with the enclosed farm landscape.

Boundary and Linear Features

9 There are an estimated 1.8 million kilometres of the *Boundary and Linear Features* Broad Habitat (excluding roads and railways) in the UK. In England, Wales and Northern Ireland, hedges and other woody features are the dominant field boundary types. In Scotland fences are more widespread.

10 The declines in length of hedges and walls reported for the 1980s in Great Britain have generally halted, and in the case of hedges in England and Wales, there is some evidence that losses in the early 1990s have reversed. This has been achieved by a shift in balance between hedge removal and planting, hedge restoration and damage, and wall removal and re-construction. Comparison with the 1980s shows that rates of hedge planting are similar but rates of removal have fallen markedly. There is evidence for a gradual degeneration of woody linear features as some hedges degenerate to remnant hedges and some of these in turn degenerate to lines of trees or shrubs. But, unlike the 1980s and early 1990s, restoration and management largely counteract these trends. The stock of lines of trees and shrubs is reported for the first time and contributes significantly to the extent of the Broad Habitat. The Northern Ireland Countryside Survey records a net loss of hedges and earth banks between 1990 and 1998.

11 There is some evidence from the analysis of vegetation associated with *Boundary and Linear Features* of a decline in the condition of the Broad Habitat. The vegetation of some hedges and roadside verges is less species-rich and more dominated by tall, competitive plants, associated more fertile situations, compared to 1990. These changes are an issue especially in the intensively farmed landscapes of England and Wales, where linear features serve as an important habitat and refuge for wildlife. However, not all hedges or verges are affected and, for example, species diversity increased on roadside verges in the Scottish lowlands.

Woodlands

12 The changes in *Broadleaved* and *Coniferous Woodlands*, recorded by the surveys in Great Britain and Northern Ireland, suggest that some important environmental gains have been made during the 1990s.

13 The area of the *Broadleaved, Mixed and Yew Woodland* Broad Habitat increased by about 5% to 1.5 million ha in 1998. It now covers more than 6% of the UK. The expansion of *Broadleaved Woodland* is consistent with current policies to increase the area of native woodlands. This gain in area is to some extent offset by evidence of a decline in habitat quality, resulting from widespread nutrient enrichment in longer established woodlands, and a decline in ancient woodland indicator species. New woodlands planted on former agricultural land also have a higher nutrient status than the existing woodland stock. It is uncertain to what extent new woodlands can compensate ecologically for the loss of older woods.

14 The *Coniferous Woodland* Broad Habitat covers an area of about 1.4 million ha in the UK, or 6% of the total land area. The stock of this habitat shows no net change in the 1990s, with losses in the lowlands tending to exceed gains in the uplands. The expansion of *Coniferous Woodland* has been a major feature of the post-war period, often at the expense of semi-natural habitats such as heath and bog. In the 1990s this expansion stopped and Countryside Survey 2000 provides some evidence of conversion of existing plantations to *Broadleaved Woodlands*, especially in the lowlands. However, some continuing losses of *Dwarf Shrub Heath, Bog* and *Broadleaved*

Woodland to the *Coniferous* Broad Habitat have also occurred.

15 The analysis of the vegetation data for the *Coniferous Woodland* Broad Habitat provides no clear evidence that the structure and flora of these plantations is becoming more diverse. However, it may be too early to detect the widespread effects of recent changes in forestry policy.

Mountain, moor, heath and down

16 The major widespread semi-natural Broad Habitats of *Acid Grassland, Dwarf Shrub Heath, Fen Marsh and Swamp, Bog, Calcareous Grassland, Bracken, Montane* and *Inland Rock* cover an estimated 6.4 million ha, a quarter of the UK land area. The Habitats are mostly concentrated in the upland Environmental Zones of England and Wales, Scotland and Northern Ireland, where they are important resources for biodiversity, outdoor recreation and rough grazing.

17 In the 1990s the stock of *Dwarf Shrub Heath* and *Bracken* changed locally but showed no significant net change for the UK as a whole. *Bog* decreased in Northern Ireland. *Acid* and *Calcareous Grassland* Broad Habitats declined by 11% and 18%, respectively. Losses of *Acid Grassland* are greatest in England and Wales and involve changes to *Improved Grassland, Bracken* and *Fen, Marsh and Swamp*. Loss of *Calcareous Grassland* is mainly to *Improved Grassland*.

18 The *Fen, Marsh and Swamp* Broad Habitat increased by about 17% for the UK as a whole, though there are losses reported in Northern Ireland. In the uplands of Great Britain, this habitat gained area from *Improved* and *Acid Grasslands*. The change appears to be associated with grassland reversion and the expansion of rushes. *Fen, Marsh and Swamp* includes a number of priority habitats for conservation and the increase in area may be generally regarded as a benefit for biodiversity, but the exchanges of land with other semi-natural habitats need to be investigated further.

19 The ecological quality of some of the more widespread semi-natural habitats has remained stable but others have declined since 1990. In *Bog* and *Dwarf Shrub Heath* the characteristic heath and bog vegetation declined and moorland grass increased. Changes in vegetation may indicate the impact of increasing fertility levels. It is uncertain to what extent grazing management and deposition of atmospheric nitrogen are the driving forces behind these changes.

20 Countryside Survey 2000 shows that soil acidity has fallen since 1978 in acid soils most commonly associated with upland environments. Moorland grass mosaics and heath and bog vegetation also show shifts in the 1990s in favour of plants associated with less acid soils. These new trends suggest a possible reversal of acidification and deserve closer inspection.

21 Changes in extent and condition of *Acid* and *Calcareous Grassland, Dwarf Shrub Heath* and *Bog* Broad Habitats tend to be contrary to the general objectives and specific targets to maintain and enhance these habitats set out recently in the UK Biodiversity Action Plan. The results of CS2000 and NICS2000 help to clarify the scale and nature of the problems and emphasise the need for concerted action to maintain and enhance biodiversity in these Broad Habitats.

Rivers, Streams and Standing Waters

22 The *Standing Waters* Broad Habitat was assessed in terms of the number and area of inland water bodies. The *Rivers and Streams* Broad Habitat was assessed in terms of the biological condition of the water course, the

structure of the river corridor and the status of streamside vegetation.

23 The total area of the *Standing Waters* Broad Habitat in Great Britain is about 190,000 ha, comprising nearly 400,000 inland water bodies. The area of inland water bodies has not changed significantly during the 1990s, but the number of small inland water bodies has increased over the decade. The results from CS2000 indicate a 6% net increase in lowland ponds between 1990 and 1998. This reverses the losses observed in the 1980s.

24 There has been a marked improvement in the biological condition of small rivers and streams in England and Wales, and Scotland since 1990. Streams in the best biological condition are commonly those with the least modification to their river corridor.

25 These gains within the freshwater environment should be set against evidence of a decline in the diversity of streamside vegetation. During the 1990s, tall growing, common grasses and herbs and woody species increased at the expense of lower growing stress-tolerating plants, which are also declining elsewhere in the landscape. This trend probably results from less intensive or different forms of land management, including the creation of 'buffer strips'.

Developed land in rural areas

26 Countryside Survey 2000 is intended primarily as a survey of rural land, and core urban areas are not included in the field survey. However, the Survey does provide some information about development in rural areas, and how the stock of developed land has changed since 1990. Comparable data have not been calculated for Northern Ireland.

27 Land under settlements or transport infrastructure (e.g. roads and railways) covers about 2.3 million ha, almost 10% of the total land surface of Great Britain. In rural areas the cover of developed land, that is the combined stock of *Built-Up and Gardens* and transport features, increased by about 4% since 1990.

28 Most of the increase in developed land in rural areas has occurred in England and Wales on improved agricultural land, but a significant proportion has taken place at the expense of *Broadleaved Woodland* and *Neutral Grassland*. However, these losses of habitats to development are partly compensated, in simple area terms, by restoration of previously developed land. Indeed, the results suggest that more *Broadleaved Woodland* was restored from developed land in rural areas than was lost to new development.

Developing a landscape view

29 It is valuable to have information about stock and change presented for each Broad Habitat because they are often under different management regimes. However it is also important to consider how the changes for individual Broad Habitats relate to each other, and what consequences these might have in terms of the landscapes in which they occur. In this preliminary analysis we have made a first attempt at a more integrated view of change for the six broad Environmental Zones in Great Britain. The results show some important contrasts between Environmental Zones that may have implications for landscape change and policy responses in different regions. This type of analysis will be developed further when zonal accounts for land cover are completed, and more detailed information on the geographical distribution of habitats becomes available from Land Cover Map 2000.

Where next?

30 This report presents some of the data on stock and change of Broad Habitats including vegetation, linear features, freshwaters and soils; more will be made available on the Countryside Survey 2000 web site. The new Land Cover Map 2000 will be ready in 2001, and the results are being compiled of the survey of breeding birds and soil analyses. A series of important research tasks and issues lay ahead in order to better understand the significance of the results and the underlying causes.

31 One of the most important scientific challenges is to bring together the field survey and Land Cover Map 2000 data. The comprehensive coverage of the Land Cover Map complements the ecological detail of the field survey. Integration of the two data sets will help us to infer more detail about Broad Habitats and their species than the Land Cover Map alone can offer. The Land Cover Map also offers a framework for extrapolation of field observations giving much greater precision than we can achieve at present.

32 Much of the analysis to date has concerned ecological changes in the countryside for which the scientific methods are well developed. However, changes in the appearance and the cultural values of the landscape matter just as much to many people. As part of the *Quality of Life Counts* initiative the Government intends to develop an indicator of 'countryside quality', which will draw together information on countryside character with changes measured in Countryside Survey 2000.

33 The results of Countryside Survey 2000 and the Northern Ireland Countryside Survey 2000 clearly show that some of the negative trends of habitat loss evident in the countryside before 1990 have been slowed, halted or reversed. These gains partly result from policy measures implemented over the last decade, such as incentives for hedgerow management and farm woodland schemes. However, it may be too early to see the benefits of more recent policy changes, and so the results of the Countryside Surveys represent a base-line to help assess the effectiveness of these new measures.

34 The results of the Countryside Surveys also allow us to put the gains that have been observed in a broader context. For while there have been some successes, there is evidence that the condition of many habitats has declined since 1990, continuing trends that were apparent in the 1980s. This is especially so in the less improved agricultural grasslands and semi-natural upland habitats of *Dwarf Shrub Heath, Bog* and *Acid Grassland*. There is some evidence from the analysis of vegetation for widespread nutrient enrichment, or eutrophication. Such changes may reflect wider environmental and economic pressures. Further work is required to understand the patterns of change that have been detected and to understand their policy implications.

35 It is clear that if we are to manage change and adapt policies so that they deliver the many things that we want from the countryside then we will need to periodically update our information base and our core indicators. As in the past, it is likely that new information needs will be identified and new methods of survey developed. However some continuity with previous work is essential for the detection and assessment of long term trends. The results of Countryside Survey 2000 and the Northern Ireland Countryside Survey 2000 need to be fully and critically evaluated so that we can learn from them and be well prepared to meet the demand for future surveys.