PLANS FOR LAUNCH OF RESULTS

The headline results from Countryside Survey 2000 will be published in November this year, and plans are now being put together for the launch event and the long term dissemination of information from the Survey.

The launch by a Minister will take place in London, in front of an invited audience drawn from a spectrum of the potential user community and the media. The event will include presentations on the key findings and will provide information about some of the main applications of the data, though a series of posters and demonstrations.

A summary report describing the background to the Survey and its main results will be published at the time of the launch. It will describe the status of the widespread Broad Habitats, landscape features such as field boundaries, vegetation, soils and fresh waters in the wider countryside. The publication will illustrate some of the first output from Land Cover Map 2000.

Countryside Survey 2000 has been co-ordinated with a similar survey in Northern Ireland (NICS). Although the detailed results of NICS will be published elsewhere, the CS2000 Report will, for the first time, be able to bring together information from these two surveys to give a picture of the stock and change of some Broad Habitats at the UK level.

The launch and associated publications are part of the longer-term dissemination strategy for CS2000 (see pages 4-5). Given the wide scope of the Survey, it will be impossible to report on all aspects of the results in November. Thus the launch will be supported by the further development of the CS2000 web site (http://www.cs2000.org.uk) through which data, other information and additional publications will become available. The site might, for example, provide access to all the contract reports arising out of the modules in the CS2000 work programme. It will also provide overviews of the on-going detailed analysis of CS2000 data and how the information is being used.

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AIRBORNE IMAGERY

What can this contribute to Countryside Survey?

Countryside Survey 2000 involves detailed field survey of 568 selected 1 km squares and a land cover census of the whole country derived using satellite data. Airborne remote sensing offers an intermediate extent and scale of study but, to date, has been little used in Countryside Survey. A component of CS2000 therefore aims to investigate the potential contribution of such data to future Countryside Surveys.

The focus of this work is on identifying the extent and spatial patterns of land cover, linear landscape features and widespread Broad Habitats. Two very different forms of airborne remotely sensed data were supplied by the Environment Agency for this work: casi and LIDAR (see box). We are using 4 pairs of example survey squares representing the Environmental Zones in England. Each pair has been divided into a trial and a check square, to allow the development, refinement, and validation of methods and their subsequent ‘blind testing’. Analysis is currently focussing on 1 km trial squares using integrated casi-LIDAR data acquired in summer 1999. Statistics will be derived for each square on the spatial coverage of land cover types and correspondence with Field Survey data. Additionally, for one of these sites, in Wiltshire, a comparison is being made with casi imagery from summer 1998, and between the 1 km square and surrounding 3 x 3 km area.

Despite difficulties in collecting data in 1998 work is now progressing well and is on schedule. Fully integrated casi-LIDAR data sets have been generated for the four 1 km trial squares, and classifications are now complete. Procedures for knowledge-based correction, based on class probabilities, LIDAR height data, context and CS1990 codes, have been developed. Once applied, validation against CS2000 Broad Habitat data and the blind application of procedures to the four check squares will be performed.

The use of integrated airborne imagery and a more object-oriented method of analysis should enable a 3-dimensional understanding of landscape structure and pattern. This is important, given that the arrangement, structure and continuity of landscape features, (such as hedges and woodlands, which form wildlife corridors and habitat islands), can influence species diversity in the wider countryside.

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YEAR TO YEAR CHANGES IN VEGETATION

Any gardener knows that plants grow better in some years than others. If the same is true of plants in the countryside, how does this affect the sort of vegetation data collected during the CS2000 field survey? An aspect of the CS2000 research programme addressed the issue of year to year variability in vegetation: whether it was likely to influence Countryside Survey results and how it might relate to weather patterns.

A team of plant surveyors recorded plants growing in permanently marked plots at Environmental Change Network (ECN) sites throughout the UK in 1998 and 1999. ECN sites are intensively monitored for a wide range of environmental variables, including climate, and much background information is available. For many of the plots there were comparable vegetation records from 1997, 1996 and in some cases 1994, which allowed us to build up an impression of changes over several years. The data were analysed by testing for year to year differences in several ‘indicators of botanical diversity’, which are also being used by the CS2000 main survey. These include the number of species in a plot and various measures of species characteristics, such as how ‘weedy’ a species is. The Countryside Vegetation System was used to classify the vegetation in each plot in each year.

Changes were not uncommon, for example, between 1998 and 1999, 12% of plots changed classification. Species number per plot also varied considerably and tended to decrease in the period 1997 to 1999 (see figure). This pattern was especially marked in fertile agricultural grasslands and may in this case depend on the number of weed species in any particular year. In less fertile grasslands, typical of ‘unimproved’ rough pasture, there was a small shift towards species adapted to high nutrient conditions in 1999. This may reflect an ongoing increase in fertility from nitrogenous air pollution and agricultural practice, already detected in CS1990 data. It is notable that the period 1995-7 was much drier than between 1997 and 1999 and weather is probably responsible for at least some of the changes, but more work remains to be done in this area.

In comparison to some of the major changes in land use which have taken place in the British countryside, year to year changes in vegetation are relatively small, but they are not negligible. As our understanding of these changes improves it should enhance our ability to extract useful information from Countryside Survey results. If, as seems likely, more extreme weather conditions are becoming more common, this will become increasingly important in future.
Reporting and understanding the status and changes in the British countryside, and developing national policies to manage these changes requires two essential elements. First, good quality data and scientific research on which to base decisions; and second, information systems that can provide easy access to data and research results for policy development purposes. CS2000 is providing a major update to information on the habitats, plants, landscape features and land types of Great Britain, and is repeating and extending surveys carried out over the last 20 years. The Countryside Information System (CIS) is one of the main means of delivering the results of CS2000 to policy advisors, planners and researchers within the DETR, other government departments and agencies, and outside.

The CIS is a Microsoft Windows based system that enables joint analysis of a wide range of environmental and administrative information at national and regional scales, with the 1 km cells of the national grid being used as its basic spatial unit. The CIS holds sample-based information derived from Countryside Survey 1990 (CS1990) and two previous surveys in 1978 and 1984. All three surveys were conducted using the ITE Land Classification, and the CIS uses this sampling framework to produce estimations for any geographical region. The sample data will be extended when the results of the CS2000 are made available in CIS format. The new release of CIS, version 6.0, already includes a number of enhancements to accommodate improved access to the results of CS2000. Examples are the inclusion of revised ITE Land Classes, the ability to produce cross-tabulations of the data and separate reporting for England, Scotland, Wales, Northern Ireland and other administrative regions.

Although originally developed to provide access to Countryside Survey data, the CIS makes a wide range of other environmental data available. The CIS includes many census-based datasets at national scales, such as the ITE Land Cover Map of Great Britain, the distribution of 1 km grid squares under different statutory designations (e.g. Sites of Special Scientific Interest, National Parks, Environmentally Sensitive Areas), species distributions, Natural Areas, soils, topography, farm types, local authorities and Parliamentary Constituencies. As part of CS2000, Land Cover Map 2000 (LCM2000) will be made available in CIS format. LCM2000 uses the Broad Habitat framework developed in the UK Biodiversity Action Plan, and CIS will provide information on the Broad Habitat composition of each 1 km square in the UK. CIS v6.0 has been developed to include Northern Ireland data, employing the different land class and grid reference systems used in Northern Ireland.

CIS v6.0 has many other enhancements. For example, the definition of the Great Britain map has been updated using 1997 Ordnance Survey data to remove a number of minor anomalies and to include inter-tidal areas. The analysis and display routines of CIS have been improved to allow for the immediate display of analysed census and sample data when the files are opened. Users can now customise the ranges and colours of the datasets displayed by CIS to suit their preferences and save these settings as default configurations for the datasets. These enhancements have necessitated revisions to all the CIS file formats, but automatic conversion routines have been provided to eliminate any upgrade issues.
The CIS provides a relatively simple system for the integration of a broad range of environmental data and in terms of CS2000 it is a very easy and useful way for linking CS2000 data with other datasets. The CIS allows users to quickly combine, analyse and explore these data. In particular, it can be used to define and combine the environmental characteristics of different areas, or the geographical patterns exhibited by one or more environmental parameters. In terms of informing policy, the CIS has applications in many strategic environmental and countryside issues. The Centre for Ecology and Hydrology (CEH) has produced four case studies investigating the application of CIS in (i) informing woodland policy, (ii) comparing alternate landscape classifications, (iii) the strategic ecological assessment of COMAH (Control of Major Accident Hazards) sites, and (iv) the strategic ecological assessment of road development. The case studies can be downloaded from the CIS web site (address given below).

CIS has been used on a regular basis by DETR to provide access to results of CS1990. For example, CIS has been used to support policy development on Access to Open Countryside by mapping the distribution of mountain, moorland, heath, down and common land. Recently, DETR have demonstrated how CIS can be used to help assess the changing ecological characteristics of the Countryside Agency/English Nature Character/Natural Areas using data from CS1990.

The CIS is a commercial product available under a separate licence. The dissemination and support of CIS is the responsibility of CEH at Monks Woods (formerly ITE Monks Wood), under contract to DETR. Information about the CIS software and associated datasets, software updates and data downloads is available at the CIS web site, www.cis-web.org.uk. Alternatively, for any enquiries please contact Countryside Information System Support, CEH Monks Wood, Abbots Ripton, Huntingdon, Cambs. PE28 2LS. Tel: 01487 772400. Fax: 01487 773467. E-mail: cis@ceh.ac.uk.

Countryside Survey 2000 is generating a large amount of data and information. These data will be made available in a wide variety of forms to users of many interests and abilities. Access to the results of the previous Countryside Survey in 1990 was to a large extent limited to data published in reports and papers or in electronic form using the Countryside Information System (CIS). However, with the increasing use of the Internet and World Wide Web (WWW) it is now possible to use these technologies to provide more dynamic access and support for CS2000 and previous survey data.

The CS2000 Data Dissemination Strategy describes the already established agreements and policies governing access to the field survey and Land Cover Map data. It also outlines the anticipated range and types of data outputs and access, and the plans for the promotion, dissemination and support of these products during and beyond the lifetime of the CS2000 Project. Arrangements for access to CS2000 data are provided by the CS2000 Data Access Policy which covers the field survey data, and a separate agreement with consortium members covering Land Cover Map 2000.

The information arising from the CS2000 field surveys will be made available at three different levels of detail:

- **Level 1:** Summary statistics, indicators and accounts at national, country and “zonal” levels. These will be disseminated via the Internet as well as in the form of reports published by DETR.

- **Level 2:** Land class sample data sets for the Countryside Information System (CIS) or other customised Geographical Information System (GIS) containing mean and variance data for the main reporting categories.

- **Level 3:** Data access services for bespoke analysis of data, thematic or zonal reporting. Derived data sets without detailed location information will be available to third parties. Such data will be licensed for the sole use of the third party concerned.

Land Cover Map 2000 (LCM2000) data will be available for bona fide research purposes whilst summary data at a one kilometre square resolution, will be provided as fully-supported data sets for the CIS.

A large amount of data in Levels 1 and 2 will be freely available in electronic form. Furthermore, government departments and agencies (or their contractors), educational establishments and charitable trusts will not be liable for licensing fees for Level 3 field survey data derived from CS2000. However, this does not imply that there will be no costs associated with access to data or no constraints on its use. Charges for using LCM2000 data will vary depending on the user and the use to which it is put.

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In May 1999, the UK Government published *A better quality of life: a strategy for sustainable development in the UK*. Sustainable development is about ensuring a better quality of life for everyone, now and for generations to come. It means a more inclusive society, in which the benefits of increased economic prosperity are widely shared, with less pollution and less wasteful use of natural resources.

Knowing whether the UK is meeting the sustainable development goal is a question of measuring and monitoring trends, including changes in the countryside and the environment generally. The Government’s sustainable development strategy therefore includes 15 ‘headline indicators’ that provide a broad view of trends, and 150 others that focus on specific issues and identify areas for action. The headline indicator for biodiversity is populations of wild birds and this indicator highlights a trend of declining populations of farmland birds. Through the UK Biodiversity Action Plan the Government is seeking to halt and reverse these trends.

Two of the ‘core set’ of 150 indicators, are based solely on Countryside Survey data and will assist with assessing change in wildlife habitats and selected landscape features in the wider countryside.

**Indicator S3: Trends in plant diversity**

The indicator of plant diversity is intended as a measure of progress towards reversing the decline of UK wildlife and habitats. Figure 1 shows significant declines in plant species diversity in moorland grass, infertile grassland and upland wooded habitats between 1978 and 1990, based on results of the Countryside Survey. By contrast, an increase in species diversity in heath/bog vegetation is evident. The declines reflect an overall shift towards more intensively managed and nutrient-rich vegetation; the increase in heath/bog vegetation analysis addresses issues of change in quantity and quality. Providing answers depends on an integrated analysis of mapped land cover data and detailed vegetation plot records from within each of the 1 km sample squares (Fig 1). This integration is the responsibility of two teams of analysts working at the Centre for Ecology and Hydrology at Merlewood. One team – the Spatial Analysis Group (SAG) – is looking at changes in land cover and interpreting these changes in terms of the new Biodiversity Action Plan Broad Habitat types. The second team – the Vegetation Analysis Group (VAG) – is analysing changes at the detailed vegetation plot level. Both teams work closely together and indeed depend on each other for key inputs into the analyses. For example the vegetation analysts need to know the habitat type at the location of a vegetation plot, whilst the spatial analysis team require characterisations of each habitat type in terms of vegetation plot data.

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**Analysis of CS2000 broad habitat data**

The analysis of the data recorded during CS2000 aims to answer questions such as: has the area of acid grassland habitat changed in different parts of Great Britain? If so what type of habitat was lost or gained as a result? What did these changes mean for the species diversity of the vegetation? These questions address issues of change in quantity and quality. Providing answers depends on an integrated analysis of mapped land cover data and detailed vegetation plot records from within each of the 1 km sample squares (Fig 1). This integration is the responsibility of two teams of analysts working at the Centre for Ecology and Hydrology at Merlewood. One team – the Spatial Analysis Group (SAG) – is looking at changes in land cover and interpreting these changes in terms of the new Biodiversity Action Plan Broad Habitat types. The second team – the Vegetation Analysis Group (VAG) – is analysing changes at the detailed vegetation plot level. Both teams work closely together and indeed depend on each other for key inputs into the analyses. For example the vegetation analysts need to know the habitat type at the location of a vegetation plot, whilst the spatial analysis team require characterisations of each habitat type in terms of vegetation plot data.
vegetation is associated with an increase in grasses at the expense of typical plants of bog and heath. These changes in plant diversity are associated with agricultural intensification, management of field boundaries and atmospheric pollution. We await the results of Countryside Survey 2000 to update this indicator and see if the trends have improved since 1990.

**Indicator S5: Hedges, stone walls and ponds**

This indicator relates to the conservation of individual features that are important components of the UK landscape and that also represent valuable habitats for wildlife. The indicator shows that hedges, walls and ponds have been in decline through the 1980s and early 1990s, mainly due to lack of appropriate management. Most significant has been the loss of hedgerows; the length of managed hedgerows decreased by nearly one third between 1984 and 1993. Although more hedges are now being planted than uprooted, the problem of maintenance remains. The target in the UK Biodiversity Action Plan is to halt all loss of ancient and species-rich hedgerows and to achieve favourable conservation management of 50% of such hedges by 2005. CS2000 has been specially designed to provide improved information on species-rich hedgerows.

These two indicators are just the tip of the iceberg as far as information from Countryside Survey is concerned and they illustrate how the results of the Survey can influence policy development towards a more sustainable countryside. The indicators are published in *Quality of life counts – indicators for a strategy for sustainable development for the United Kingdom: a baseline assessment* and can be viewed on DETR’s web site at: www.environment.detr.gov.uk/sustainable/quality99/index.htm.
UNDERSTANDING THE DRIVERS OF COUNTRYSIDE CHANGE

Countryside Survey will provide a wealth of information about the extent and quality of the different rural environments of Britain. It will also reveal recent changes in the extent and quality of these environments. However, although clearly important, when using these data in a policy context, we will need to understand not only what changes are occurring but also what the underlying causes (drivers) of those changes might be.

In designing CS2000, it was always recognised that an understanding of the drivers of countryside change was necessary to interpret and respond to the results of the survey. Therefore a new programme of work will review the underlying social, economic and policy factors that initiate countryside change. A consortium (see box) led by the Centre for Ecology and Hydrology (CEH) will undertake the work, which is funded by DETR.

The work programme is made up of three elements. The first concerns the general issues of rural change and sustainability, and will entail development of a conceptual framework in which the general socio-economic trends and pressures in rural areas can be understood. The other two modules, which focus on agriculture and forestry, have been designed to examine these themes in greater depth. In the long term, the goal is to focus on how other research or data can be used alongside CS2000 to develop and broaden its policy relevance. The work will help set CS2000 outputs in a policy context, and allow us to explore how we might pick up the implications of the changing social, economic and policy drivers in these outputs.

It is recognised that the problem of understanding the drivers of countryside change goes much more widely than CS2000, and the team members would be interested to hear of other on-going work in this important area of concern.

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Project aims
To support the presentation of the first outputs from Countryside Survey 2000 with a detailed review and analysis of the social, economic and policy drivers relevant to understanding the patterns of change detected since the earlier surveys.

To shape DETR’s long term research strategy in relation to the social, economic and policy drivers of countryside change, so that more effective and integrated policies for achieving sustainable development can be developed.

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