

COUNTRYSIDE SURVEY 2000

DECEMBER '98 Issue 2

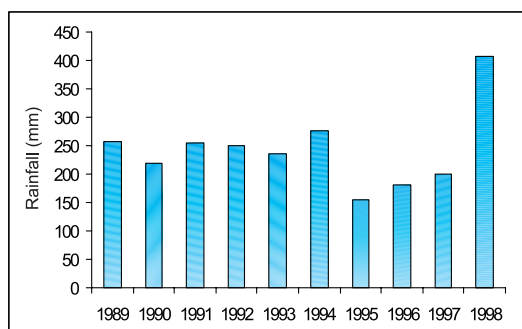
NEWS

NEWSLETTER FOR THE COUNTRYSIDE SURVEY 2000

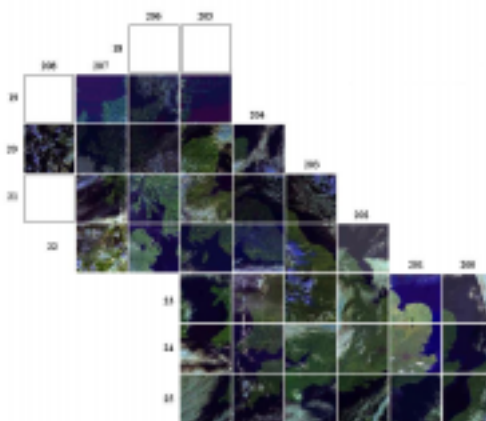
SURVEYORS TAKE ON ONE OF THE WETTEST SUMMERS IN RECENT HISTORY

Early promise of clear skies and a warm summer quickly turned sour as one of the wettest summers in recent history affected many parts of the country.

There could hardly have been a worse start for CS2000 field work, as the onset of wet weather at the end of May coincided with the completion of a fortnight of intensive training. For those surveyors desperately trying to make progress while battling against the elements, the distant memories of sitting in a stifling hot meeting room in mid-May, trying to pay attention to all that was thrown at them during a fortnight's training course, were hazy indeed. Nevertheless, the pairs of surveyors, based at the six ITE research stations, managed to turn theory into practice and complete over 90% of the survey target. Nearly all of the 365 1 km squares in England and Wales have been surveyed leaving just under 50 squares unsurveyed in Scotland. Attempts are being made to secure additional funding so that these sites can be completed in 1999.



Total rainfall for the 3 months June to August recorded at Merlewood Research Station (Cumbria)



Original Data (ESA 1997-98), distributed by Eurimage/NRSC, Farnborough. Thumbnails retrieved from EiNet (Eurimage's On-line Catalogue and Retrieval System).

Another part of the CS2000 programme was affected by the summers weather. The Land Cover Map 2000 (LCM2000) uses pairs of summer and winter scenes that are combined to distinguish land cover (for example, arable areas alternate between bare ground and full plant cover, evergreen trees can be separated from deciduous). Good images are available for winter 97/98 but persistent cloud cover, particularly in the north and west, means that fewer than expected clear summer images were obtained. Summer 1999 imagery will be sought to fill the remaining gaps. Despite these problems, it is known that well over half of Britain has been covered by both summer and winter imagery and processing for England and south Wales is underway.

Reporting on the status of the Biodiversity Action Plan 'Broad Habitats' is an aim of both the field survey and LCM2000. The LCM2000 team attended the field surveyors' training course, to ensure application of the Broad Habitat Classification is compatible between field survey and LCM. A series of reconnaissance surveys collecting data for future training of classification procedure has been carried out by the LCM team. Data from the field survey will be used to validate the LCM.

CONTENTS

Designing a sampling framework

Specialist team for freshwater sampling

Shorts....

- Anecdotes suggest some interesting results to come
- Britain joins Europe
- OECD workshop
- RAMSAR convention report
- Web site goes live

Is nitrogen pollution threatening our heather moorlands?

DESIGNING A SAMPLING FRAMEWORK

In the first of a series of articles about the CS2000 approach, Colin Barr explains how the sites for the field survey were selected.

In the early 1970s ITE Scientists Bob Bunce and Wally Shaw carried out a sample survey of the Lake District National Park. They wanted to design an approach that ensured sampled areas were representative of the whole region. Previously they had spent several years surveying and classifying vegetation in woodlands using vegetation plots and species lists. It occurred to them that this approach to sampling could be 'scaled up' to study landscapes, with 1 km squares replacing vegetation plots and environmental attributes (such as altitude, geology and climate) used instead of plant species. Pioneering work in the Lake District National Park was then extended and tested in Cumbria, Lancashire and other regions of Great Britain.

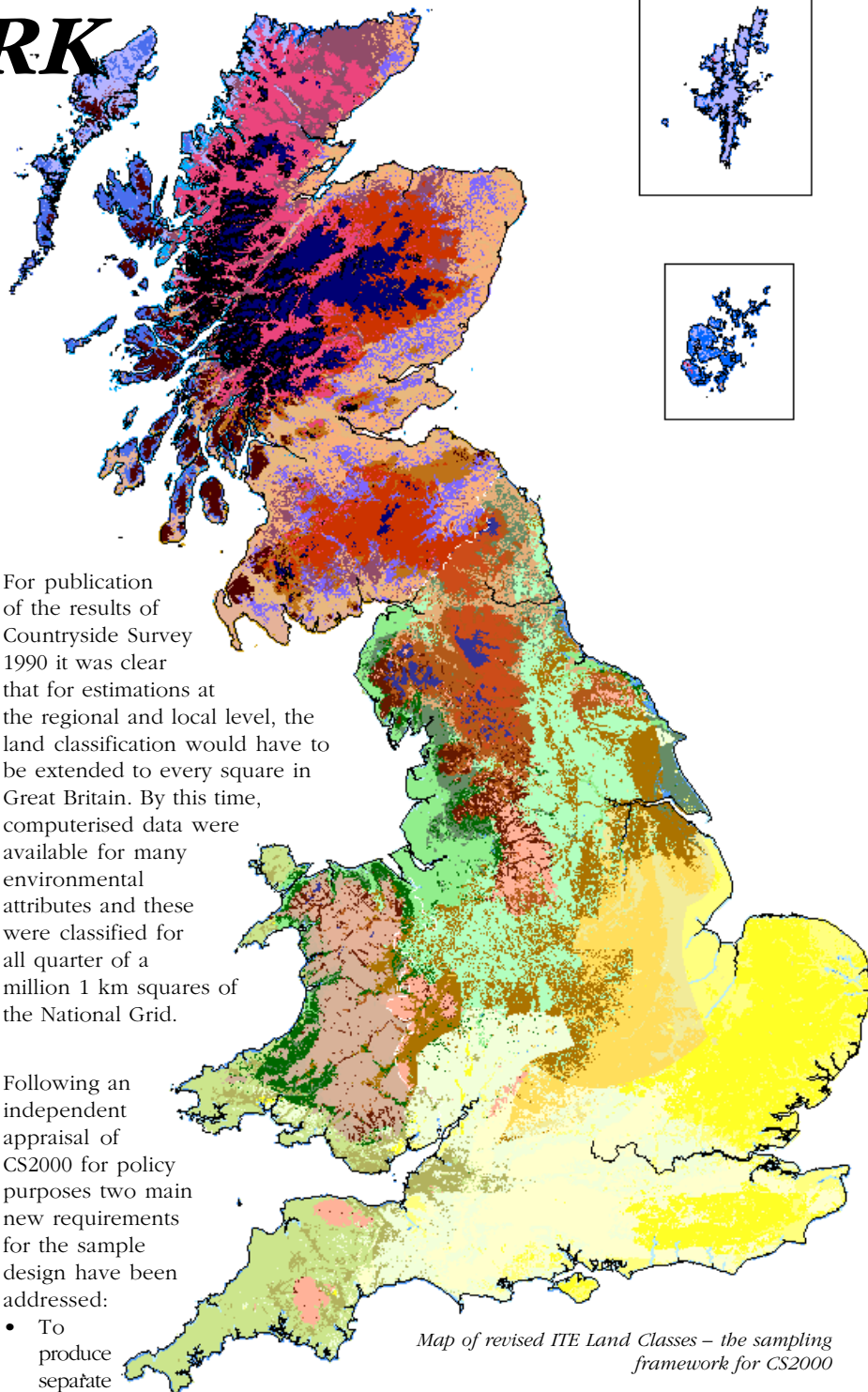
In many ways the approach is analogous to that used in opinion polls. We know that in ecological terms, it is likely that different species and ecological processes occur in different types of land. A simple stratification might divide the land surface into different altitude ranges so that uplands and lowlands, which tend to have different ecological characteristics, are adequately sampled. Just as opinion polls attempt to sample not just different age strata but also those concerned with gender, social, racial and regional backgrounds, so other factors are important in ecological surveys. Land at a certain altitude in north-east Scotland may have different ecological affinities to land at the same altitude in east Anglia. The ITE Land Classification is based on classification of major climatic, geological and physiographic factors; including for example, average altitude, slope and rainfall. There have been three main phases of development:

1. In the mid-1970s, when the original work was being done, computing power was limited and it was not possible to create a classification of all 1 km squares in Great Britain. Instead, mapped data were classified for a regular grid of 6040 squares and 32 classes described, based on average values of environmental characteristics.

2. For publication of the results of Countryside Survey 1990 it was clear that for estimations at the regional and local level, the land classification would have to be extended to every square in Great Britain. By this time, computerised data were available for many environmental attributes and these were classified for all quarter of a million 1 km squares of the National Grid.

3. Following an independent appraisal of CS2000 for policy purposes two main new requirements for the sample design have been addressed:

- To produce separate reliable estimates of surveyed features for Scotland and England with Wales, Land Classes have been separated into their country components and some additional squares have been allocated to ensure adequate sampling of all units.
- To provide statistically reliable estimates of upland habitats in England and Wales DETR, MAFF and WO/CCW are funding the surveying of additional sites in the uplands and marginal uplands.



Map of revised ITE Land Classes – the sampling framework for CS2000

SPECIALIST TEAM FOR FRESHWATER SAMPLING

The presence or absence of freshwater plants and animals can be used to indicate the water and habitat quality of streams and rivers. The emphasis of the CS2000 freshwater habitats survey has centred on the collection of aquatic macro-invertebrates (eg shrimps, snails, worms and insects) and river corridor data using the standard national protocols of River Invertebrate Prediction and Classification System (RIVPACS) and River Habitat Survey (RHS). Macro-invertebrate samples have been collected from a single site in each square with a running watercourse present. RHS have been conducted around each of these sites and also along dry channels in squares where no watercourse was flowing at the time of the surveyors visit. Results of RHS will make the link to surrounding land use. Additional samples of chironomid exuviae (pupal skins of non-biting midges), macrophytes (large plants) and diatoms (small algae) have also been collected. Some limited water sampling will provide an indication of the chemical characteristics of each flowing water site.

The appointed surveyors already held the Environment Agency accreditation in the application of RHS. During a training course, held in June, each surveyor was also taught the additional skills needed to collect samples of the other faunal and floral groups and the field identification of aquatic plant species.

Surveying began in mid-June. A maximum of 425 squares have watercourses suitable for freshwater surveys.



Surveyor collecting a freshwater sample

Specialist skills are needed to collect freshwater data and separate teams of field surveyors trained and managed by the Institute of Freshwater Ecology conducted the survey of freshwater habitats.

Of these, 398 had suitable flowing water sites present and so the remaining 27 will only have RHS undertaken. Quality control procedures have included replicate biological sampling at 10% of sites and an independent audit of 7% of the RHS sites.

Mike Furse
Freshwater Habitats Project Leader, IFE Wareham

SHORTS

Anecdotes suggest some interesting results to come

The major purpose of a science-based survey such as CS2000 is to obtain objective and unbiased estimates of the amount and type of change that is taking place in the countryside. At this stage of such a project, as the field data is being entered onto computers, it is always tempting to speculate about the results! While not wishing to pre-judge the outcome of the survey in this way, anecdotal comments from surveyors, observations made by quality control staff and a preliminary inspection of the field records all suggest that a wide variety of changes have continued to take place between 1990 and 1998. While noting expansion of golf courses, housing estates and forestry, and increases in organic farming and hedgerow management, the surveyors have been busy accurately mapping land use and landscape features, as well as recording plant species in up to 15,000 quadrats. Just how significant such changes have been, over the whole of GB, will be revealed as the results become available early in the Millennium.

Britain joins Europe

Work started in August on the conversion of the 1990 Land Cover Map of Great Britain to CORINE land cover specification. This involves conversion from raster (grid-cell) format to vector (digital linework) with both spatial and thematic generalisations. Robin Fuller will be making a presentation on the new map to a European Environment Agency Workshop in January 1999.

OECD workshop

A paper on indicators derived from Countryside Survey 1990 was tabled at the OECD Agri-environment indicators workshop at York in September. Work is continuing to prepare indicators for the Government Sustainable Development Strategy, expected to be published in 1999.

RAMSAR convention report

The UK National Report to the 7th Meeting of the Conference of Contracting Parties to the RAMSAR Convention on Wetlands of International Importance to be held in Costa Rica in 1999 has been published. Information on the estimated extent and change in wetlands from Countryside Survey 1990 was included in the joint report as prepared by JNCC on behalf of DETR.

Web site goes live

The web site for CS2000 went live over the summer. As well as further information about the survey, the site features current and back issues of CS2000 News. The site can be found at 'www.cs2000.org.uk'.

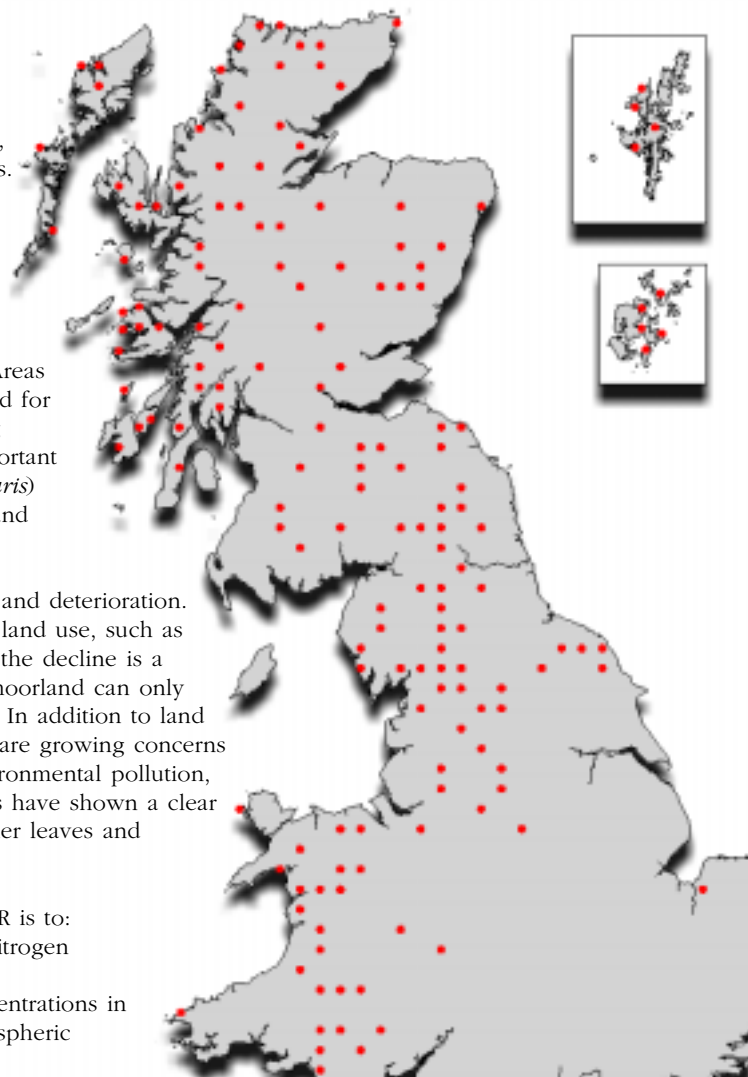
IS NITROGEN POLLUTION THREATENING OUR HEATHER MOORLANDS?

Heather (*Calluna vulgaris*) occurs throughout Europe, although it is less common in Mediterranean countries. In the north of its range (eg Scandinavia and the uplands of Scotland) it is a dominant species that occupies large tracts of uplands. Heather dominated uplands are visually attractive, especially in the late summer and the early autumn when heather is in flower. Some heather moorlands are key features of National Parks, Environmentally Sensitive Areas and Areas of Outstanding Natural Beauty, and some are managed for grouse shooting. Heather is an ecologically interesting species in its own right, but it also provides an important habitat for wildlife, such as the merlin (*Falco columbaris*) whose prey depend on heather as a source of food and cover.

The heather resource is under threat from habitat loss and deterioration. Some of the loss is directly attributable to changes in land use, such as afforestation or agricultural encroachment. Elsewhere the decline is a result of lapsed management, since healthy heather moorland can only be sustained by burning, or controlled sheep grazing. In addition to land use change and management factors, however, there are growing concerns that heather moorlands are declining because of environmental pollution, particularly from nitrogen. A number of recent studies have shown a clear relationship between nitrogen concentrations in heather leaves and nitrogen deposition from the atmosphere.

The aim of the CS2000 heather study, funded by DETR is to:

- establish whether there are regional patterns of nitrogen concentrations in heather leaves
- compare such regional patterns of nitrogen concentrations in heather leaves with regional patterns of UK atmospheric nitrogen deposition
- assess whether nitrogen concentrations in heather leaves can be used to identify areas of the UK where excess nitrogen deposition is likely to trigger a decline in the heather communities.



Collection of heather from CS2000 sample sites

Heather samples from 178 of the 1 km squares surveyed have been sent to Environmental Chemistry Section at ITE Merlewood, for nitrogen and phosphorus analysis. The sites range from Cornwall to the far north of Scotland (see map). On receipt the heather samples were checked and air-dried. The current year's growth was separated from the sample and milled through a 0.7 mm sieve. Sub-samples of the milled heather are being analysed for nitrogen and phosphorus.

Collection of heather from CS2000 sample sites

Val Kennedy
Environmental Chemistry Section,
ITE Merlewood

Countryside Survey 2000 is sponsored by: Department of the Environment, Transport and the Regions, Natural Environment Research Council, Ministry of Agriculture, Fisheries and Food, Welsh Office, Scottish Office, Environment Agency, Scottish Natural Heritage, and Countryside Council for Wales.

Countryside Survey 2000 News has been collated and produced by the Institute of Terrestrial Ecology on behalf of the DETR and NERC.



Contact address:

CS2000
Institute of Terrestrial Ecology
Merlewood Research Station
Grange over Sands
Cumbria LA11 6JU
Tel: 015395 32264
Fax: 015395 34705
E-mail: CS2000@ITE.AC.UK
<http://www.cs2000.org.uk>