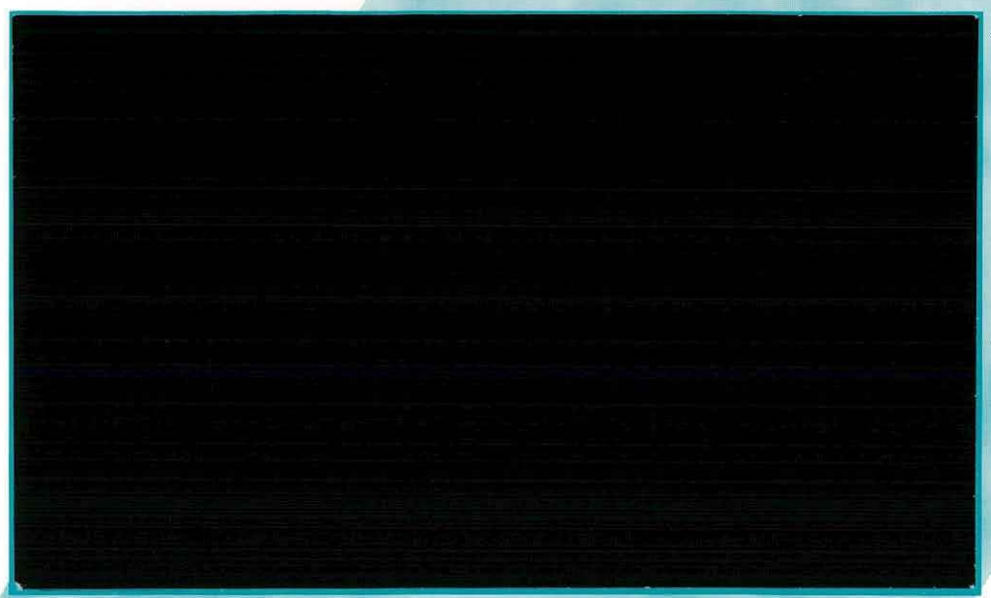
Institute of Terrestrial Ecology



Centre for Ecology & Hydrology

Natural Environment Research Council

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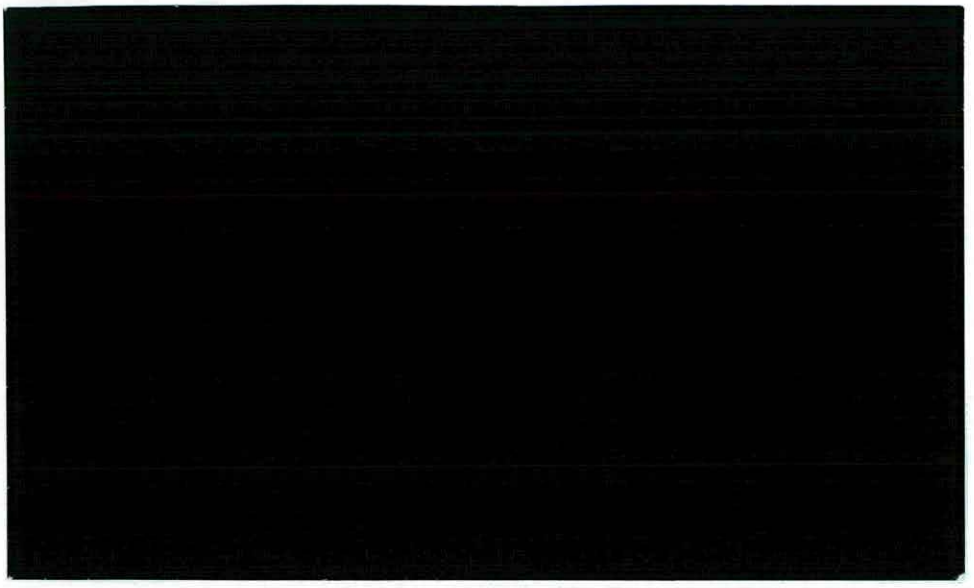

The ITE mission

The Institute of Terrestrial Ecology will develop long-term, multidisciplinary research and exploit new technology to advance the science of terrestrial ecology, leading to a better understanding and quantification of the physical, chemical and biological processes of the land.

Priority is placed on developing and applying knowledge in the following areas:

- the factors which determine the composition, structure, and processes of terrestrial ecosystems, and the characteristics of individual plant and animal species
- the dynamics of interactions between atmospheric processes, terrestrial ecosystems, soil properties and surface water quality
- the development of a sound scientific basis for monitoring, modelling and predicting environmental trends to assess past, present and future effects of natural and man-made change
- the securing, expansion and dissemination of ecological data to further scientific research and provide the basis for impartial advice on environmental protection, conservation, and the sustainable use of natural resources to governments and industry.

The Institute will provide training of the highest quality, attract commissioned projects, and contribute to international programmes.

ITE will promote the use of research facilities and data to enhance national prosperity and quality of life.

ITE Contract Report
to the
Department of the Environment, Transport and the Regions

COUNTRYSIDE SURVEY 2000

Third Integrated Progress Report

Complied by

M Hornung and S Wallis

Institute of Terrestrial Ecology
Merlewood Research Station
Grange over Sands
and
Monks Wood Research Station
Abbots Ripton

December 1999

1. Programme management, co-ordination and integration

1.1 Progress of the CS2000 programme

Summaries of progress with each of the modules are provided in Annex 1. The following presents the situation in brief:

Modules 1, 2, 3, 4, 10 and 11 are on schedule.

Module 7 has suffered delays as a result of the bad weather in summer 1998 and the resulting lack of suitable imagery. Most imagery is now in place and automated methods of data processing have been developed and implemented. Processing and analysis are unlikely to be completed to allow GB statistics derived from the Land Cover map 2000 to be included in the Summary Report. However, imagery of the distribution of selected broad habitats and patterns within broad habitats will be available for incorporation in the Summary Report and statistics may be available for the launch out with the report.

Module 8 is behind schedule as a result of technical problems with LIDAR and *casi* data acquisition. The sample squares have been re-flown and suitable data is now available. A revised timetable is under discussion with the Department and the EA.

Module 13 is now running to a modified schedule but is keeping to that schedule. The implementation of the data model is on schedule. Tools have been developed for the analysis of the vegetation and spatial data and these analyses are in progress and will achieve agreed deadlines for delivery. The development of a web based data catalogue has been brought forward to allow a prototype to be presented to potential users early in 2000.

1.2 Co-ordination and integration

The emphasis over the past 6 months has been on development of co-ordinated plans for delivery of results for inclusion in the Summary Report. Required flows of data between modules have been identified and a series of meetings held with the relevant module leaders to agree timetables which will allow delivery of outputs to the Summary Report Drafting Committee to allow them to meet their schedules. Thus, for example Modules 2 and 6 require results from Module 1 to allow them to carry out their data analysis. Module 10 will feed information to Module 1 to inform analysis of vegetation data from the field survey. All major conflicts in module schedules have now been resolved.

1.3 Progress reports and milestones

The reports delivered from individual modules and their progress against agreed milestones are given in Annex 1.

1.4 Common reporting formats

The emphasis has been on developing a common approach for presentation of results from module leaders to the drafting committee for the Summary Report and on ensuring communication between the relevant CS2000 module leaders and those leading other related initiatives which will report during 2000 or 2001. Module leaders will present tables of results to the drafting committee with a commentary for each table of c.1 to 4 pages. The tables to be delivered from each module have been identified and agreed with module leaders. Discussions have been held between the leaders of Module 1 and the Plant Atlas 2000 project to discuss integration of data.

2. Provision of independent advice and policy interpretation

Dr Roy Haines-Young continues in post as the Independent Adviser and Prof. David Briggs has joined the Module 16 team as Policy adviser. Dr Haines-Young has attended all meetings of the Advisory Group and Reporting Sub-group and a number of meetings related to the definition and delivery of the Summary Report.

A strategy was agreed with DETR in May for consulting potential users of CS2000 data about the key policy issues to which the results from the programme might have relevance and the specific data products in which the users would be interested. A first round of consultations will consider the policy issues and a second round the use of specific data products. A list of organisation and individuals to be consulted has been agreed with the Department. The consultations have begun; Dr Haines-Young is dealing with organisations represented on the Advisory Group and Prof. Briggs with others, with Dr Haines-Young providing overall co-ordination. The aim is to hold an internal workshop, on the results of the first stage of the consultations, with members of the CS2000 team in January and an external workshop with selected users in February 2000. The second phase of consultations is programmed to begin in March.

3. Provision of Secretariat for the Advisory Group, Reporting Sub-group and Joint Management Committee.

There have been meetings of the Advisory Group and Reporting Sub-group during this reporting period. The minutes of the two meetings are attached as annexes 2 and 3. Mr Stark who was responsible for secretariat activities left ITE during the reporting period and Ms Sue Wallis took over the duties while a replacement was appointed. A replacement, Dr Andrew Sier has now been appointed and will take up his post on the 28th February. Ms Wallis will continue to lead the secretariat activities for the rest of this financial year, handing over to Dr Sier on the 1st April. However, Dr Sier will attend meeting of the groups arranged for the period until 31 March to allow him to familiarise himself with procedures and the individuals involved in the groups.

4. Reporting and dissemination of information – CS2000 Newsletter and Web site.

Newsletter. The fourth Newsletter was published in November 1999.

Web site. The web pages have been revised, for example new news paragraphs have been added, a page added for Module 5, new examples of progress with the Land Cover map included and the number of automated links increased.

5. Promotion of the use of CS2000 data.

Consultations with potential users have been planned and are referred to in paragraph 2 above. In related work under Module 13, a demonstration web based catalogue of CS2000 datasets and products is being developed and will be demonstrated to potential users early in 2000.

6. Communication of results – Co-ordination, editing and production of the Summary report.

A structure and contents for the Summary report and a timetable for production were presented to the Advisory Group and agreed at the September meeting. The report will be structured around broad habitats at the level of GB, countries and environmental zones. The timetable for preparation of the Report that was originally agreed is included as annex 4. Delivery of GB-wide data from the LCM2000 will now be delayed although data for England and Wales will be available to the original schedule and will be incorporated into the report.

A meeting, involving DETR representatives, selected modules leaders and Dr Haines-Young was held at Tollgate House on the 30th November to confirm schedules and agree guidelines for release of results ahead of publication of the Summary Report. A series of meetings have been held with individual module leaders to confirm schedules and deliverables.

Annex 1

COUNTRYSIDE SURVEY 2000

MODULE PROGRESS REPORTS

DECEMBER 1999

Module title: Module 1 - Field Survey of Broad Habitats and Landscape Features		
Funded by: DETR and ITE (NERC)		
Module leader (s): C. J. Barr		
Start date: Jan 1998	**End date:** Jun 2001	**Period covered by progress report:** Sept. to Dec. 99

OBJECTIVES

- To estimate the extent and distribution of widespread habitats in Great Britain
- To characterise widespread habitats in terms of their land cover and botanical composition and to assess changes in these characteristics over time
- To derive indicators of sustainable development for the wider countryside including measures relating to biodiversity, land cover/use and landscape features
- To provide accessible databases containing information about the state of the British countryside for use in a wide range of policy and scientific applications including the detection and forecasting of long term environmental change
- To provide ground reference data for calibration and validation of a satellite-based census of land cover 'Land Cover Map 2000'

SUMMARY OF PROGRESS

- A total of 569 squares has been surveyed in 1998 and 1999.
- *A total of c. 16,853 vegetation plots had been recorded.*
- Spatial data (with associated attribute data) and vegetation plot data for all 570 squares have been entered onto computer *and initial validation has been completed.*
- Detailed data analysis specifications have been written. Timetables and protocols (for internal use) have been prepared.
- Analysis software has been developed and routine data analysis has started. Preliminary results will be available by May, 2000.

REPORTS

Barr, C.J. Feb 1998. First Progress Report to DETR.
Barr, C.J. May 1998. Countryside Survey 2000 Field Handbook 3rd Draft.
Barr, C.J. June 1998. Second Progress Report to DETR.
Barr, C.J. Sept 1998. The sampling strategy for Countryside Survey 2000.
Barr, C.J. Dec 1998. Third Progress Report to DETR.
Howard, D. C., Barr, C.J., Bunce, R.G.H. and Stark, G.J. Aug 1999. Selection of *Environmental zones* for reporting the results of CS2000
Barr, C.J. Dec 1999. Fourth Progress Report to DETR.

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	Description of Milestone	Progress
Feb 1998	Finalise module details and documentation; purchase field and analytical equipment	Module details were submitted to DETR in March 1998
Mar 1998	Interim report 1 – final sampling strategy, draft field survey protocols, recording codes and typologies	A report on the sampling strategy for CS2000 was submitted to DETR in Sept 1998.
Dec 1998	Interim report 2 – Outcome of field survey and hedgerow data (if required)	A third progress report was submitted to DETR in Dec 1998
Apr 1999	Interim report 3 – Analytical procedures and reporting frameworks for landscape pattern, land cover accounts, ecological zones and botanical analysis	A specification for the analysis has been drafted and discussed with DETR/JNCC. A report on Environmental Zones has been submitted to DETR.
Dec 1999	Interim report 4 – Completion of 1999 survey	*Submitted to DETR in Dec 1999*
Apr 2000	Preliminary results	-
Nov 2000	Draft final report	-
Feb 2001	Final report	-
Mar 2001	Report ready for publication; presentation of report at technical seminar (by end Feb 2001)	-
Jun 2001	Final report published	-

Module title: Module 2 - Survey of Freshwater Habitats		
Funded by: EA, DETR, SNH and IFE (NERC)		
Module leader (s): M. T. Furse		
Start date: Jan 1998	**End date:** June 2001	**Period covered by progress report:** up to December 1999

OBJECTIVES

- To provide information on the status and distribution of the macro-invertebrate fauna of streams and rivers in Great Britain.
- To determine and evaluate change by comparison with 1990 survey data relating to the same sites.
- To determine habitat structure and degree of modification of river corridors.
- To undertake a limited diagnostic survey of the chemical character of the watercourses to help interpret the results of macro-invertebrate and river habitat surveys.
- To investigate the relationship between the habitat quality and modification of river corridors, the ecological quality of the watercourse and the condition of the surrounding countryside.
- To derive indicators relating to status and change in watercourse and river habitat quality.

SUMMARY OF PROGRESS

- Reports have been submitted to DETR, EA and SNH to the agreed schedules.
- 432 sample squares were identified as containing or likely to contain perennial or intermittently flowing watercourse and 426 of these squares were visited. Access was refused at the other 6.
- River Habitat Surveys (RHS) were carried out in each of the 425 remaining squares with stream channels. RHS audits have been undertaken in 25 squares (ca. 6%)
- All RHS data have been entered on the project database and validated. All derived RHS indices have been calculated *as part of the production of data for the draft "summary" report.*
- Macro-invertebrate and water samples were collected from the each of the squares that contained flowing waters at the time of surveying. Replicate macro-invertebrate samples were collected from ca. 10% of squares and replicate chemical samples from ca. 9%.
- *All of the macro-invertebrate invertebrate samples have sorted and 77% have been identified*
- All of the water samples have been analysed for pH, total alkalinity and conductivity. All data have been entered on the database and validated.

REPORTS

Furse, MT and Dawson, FH July 98. R&D Progress Report E1/038/2 for the period 1st April 1998 to 30th June 1998.

Furse, MT and Dawson, FH Oct 98. R&D Progress Report E1/038/3 for the period 1st July 1998 to 30th September 1998.

Furse MT, Dawson FH, Henville P, Irons GP, Gunn RJM and Winder, JM. Nov 1998. Countryside Survey 2000 Field Handbook Module 2: Survey of Freshwater Habitats.

Furse, MT, Dawson, FH, Amarillo, ML, Blackburn, JH et al. Jan 99 Countryside Survey 2000 Module 2 - Survey Of Freshwater Habitats The Field Survey. An Interim Report the Department of the Environment, Transport and Regions and to Scottish Natural Heritage

Furse, MT and Dawson, FH Feb 99. R&D Progress Report E1/038/4 for the period 1st October 1998 to 31st January 1999.

Furse, MT, Dawson, FH, Winder, JM, Davy-Bowker, J *et al.* Apr 99 R&D Progress Report E1/038/5 for the period 1st February 1999 to 31st March 1999.

Furse, MT, Dawson, FH, , Winder, JM Blackburn, JH et al. Jul 99 R&D Progress Report E1/038/6 for the period 1st April 1999 to 30th June 1999.

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	**Description of Milestone**	**Progress**
Sep 1998	Completion of field survey	Complete
Dec 1998	Interim report on field survey	Complete
Jan 1999	IFE/DETR/EA/SNH review meeting	Held as an EA Project Board Meeting (Feb 1999).
Dec 1999	Completion of species identification, Interim report on species identification,	Sample sorting completed on schedule. Species identification slightly behind schedule and, *with DETR agreement, interim report to be produced on its completion in February.*
Apr 2000	Preparation of preliminary results	*Many RHS analyses completed*
Nov 2000	Production of draft final report	-
June 2001	Completion of project	

Module title: Module 3 - Assessing Hedgerow Characteristics and Species Diversity in Arable Margins in Countryside Survey 2000		
Funded by: MAFF		
Module leader (s): C. J. Barr		
Start date: Apr 1998	**End date:** Apr 2001	**Period covered by progress report:** Sep to Dec 1999

OBJECTIVES

- To determine the current extent and distribution of species-rich arable plant communities and the factors that contribute to their presence in England and Wales and in major regions of each country.
- To analyse the data to give information about the current extent and distribution of species-rich arable communities, and about the factors that contribute to their presence.
- To analyse the data to give information about the current extent and distribution of species rich and other hedgerows in England and Wales and in major regions of each country.
- To determine the extent and distribution of species rich and other hedgerows in England and Wales, and in major regions of each country.
- To analyse hedgerow tree data from 1990 and 1998

SUMMARY OF PROGRESS

- The additional recording of hedgerows and field margins was carried out in all surveyed squares in England and Wales. *A total of 502 arable margin plots and 2341 additional hedgerow plots was recorded. (NERC also funded 50 arable and 119 additional hedgerow plots in Scotland).*
- Data entry has been completed in synchrony with Module 1 work; the data will be integrated into the main CS databases and data structures.
- Data validation and analysis is proceeding.

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	Description of Milestone	Progress
mid May 1998	To agree a finalised methodology with the Ministry	This has been agreed.
Oct 1998	Complete field survey	A total of 2965 plots were recorded and documented.
May 1999	Enter and validate data	Data checking and entry has been completed.
Oct 1999	Analyse dataset	Analysis has started.
Jun 2001	To report the results to the Ministry	-

Module title: Module 4 - Increasing Upland Representation in Countryside Survey 2000		
Funded by: DETR, MAFF, NAW and CCW		
Module leader (s): C. J. Barr		
Start date: Apr 1998	**End date:** Apr 2001	**Period covered by progress report:** Sep to Dec 1999

OBJECTIVES

- To ensure that CS2000 provides reliable information about upland broad habitats and landscape features in England and Wales and to produce separate estimates of the stock of these features for England and Wales
- To provide information about the ecological characteristics of the uplands as a whole in order to provide a context for site, habitat or scheme specific monitoring exercises
- To provide information suitable to application to land use and environmental change modelling and forecasting studies, including the UK Climate Impacts Programme
- To establish a baseline for future detection of long term change in the character of the uplands of England and Wales

SUMMARY OF PROGRESS

- The 30 additional upland squares (25 funded by MAFF; 5 by NAW/CCW) were all surveyed during 1998 and data entry has been completed.
- The data have been integrated into the main CS datasets and structures.
- Data validation and analysis has started.

PROGRESS IN RELATION TO MILESTONES (MAFF)

Date of Milestone	Description of Milestone	Progress
mid May 1998	To agree a finalised methodology with the funders.	This has been agreed.
Oct 1998	Complete field survey	30 additional upland squares were surveyed in England and Wales.
May 1999	Enter and validate data	Data checking and entry has been completed.
Oct 1999	Analyse dataset	Data analysis has started.
Jun 2001	To report the results to the funders.	-

NB. Milestones for NAW/CCW have yet to be agreed.

Module title: Module 6 - Soil Quality and Pollution Impacts		
Funded by: DETR (Water and Land Directorate amd Air Quality Directorate), EA and NERC		
Module leader (s): H. Black and V. H. Kennedy		
Start date: Apr 1998	**End date:** Mar 2001	**Period covered by progress report:** to end Dec. 1999

OBJECTIVES

- To carry out a programme of soil sampling by the CS2000 field surveyors at the locations sampled in the 1978 Countryside Survey.
- To identify and quantify soil meso-fauna by the extraction of returned samples using conventional extraction techniques and to assess soil microbial diversity using the BIOLOG approach.
- To analyse the CS 2000 soil samples for pH and loss on ignition to allow an evaluation of change in these properties over the 20 year period between the 1978 and 1998 surveys.
- To analyse the CS 2000 soil samples for heavy metals and for a suite of organic compounds to establish a large and robust national baseline against which future sampling and analytical programmes could be compared.

Foliar nitrogen of Calluna

- To establish whether there are regional patterns of nitrogen concentrations in heather leaves
- To compare such regional patterns of nitrogen concentrations in heather leaves with regional patterns of UK atmospheric nitrogen deposition
- To 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.

SUMMARY OF PROGRESS

Soil quality

- *Measurements of soil pH have been completed on all soil samples collected this year. Loss-on-ignitions have been carried out on 75% of all samples. LOI analyses were extended to provide time for a validation exercise on the analyses of heavy including an ICP-OES / ICP-MS comparison between ITE Merlewood and The Environment Agency laboratory at Llanelli. BIOLOG analyses have been completed on this years quota (50% of all samples) and will re-start in February 2000. BIOLOG output data has been entered into Excel (75% completed for this year's samples). Soil faunal identification has been carried out on a sub-set of 125 samples. All data from this set have been entered into Excel. Taxonomic experts have been contacted for species identification and QA/QC requirements. Access databases have been set up for soil pH, LOI, BIOLOG, invertebrates, locational data and 1978 soils data and are directly linked to the Countryside Information Database.*

Foliar nitrogen of Calluna

- 179 *Calluna* samples were collected from survey squares from a range of sites from Cornawall to the north of Scotland in 1998. Current year's growth (CYG) has been separated out from all these samples and the CYG has been analysed for total (N, P, K, Ca, Mg & C).
- Initial relationships between location and N P C concentrations have been derived.
- 27 additional *Calluna* samples have been collected in 1999. All these have been air dried but await further processing.

REPORTS

Black, HIJ, Parekh, NR, Osborn, D, Rollett, AJ & P Rowland. 1999. MASQ: MONITORING AND ASSESSING SOIL QUALITY. NERC/DETR/EA funded: ITE Project Number T01069a5. Module 6: Soils and Pollution. Progress Report 3 to The Environment Agency. July 1999

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Black, HIJ, Osborn, D, Parekh, N and P Rowland P. 1999. MASQ: MONITORING AND ASSESSING SOIL QUALITY. Scoping Study for MASQ. Analyses of Heavy Metals and Organic Pollutants from the CS2000 Soil Samples. Report to The Environment Agency. May.

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Kennedy, V..H Progess Report to Air Quality Division Nov 1998.

PROGRESS IN RELATION TO MILESTONES - SOILS

Date of Milestone	Description of Milestone	Progress
May 98	Finalise sampling strategy, develop sampling and analytical procedures	
Jun 98	Progress report to Land and Water Quality Directorate	Submitted June 1998
Oct 98	Complete field sampling; progress report to Land and Water Quality Directorate	Submitted Oct 1998
Jan 99	Progress report to Land and Water Quality Directorate	Submitted Jan 1999
Mar 99	Complete pH and loss on ignition; all samples processed; report to Land and Water Quality Directorate on Phase I & II	All 1998 samples have been processed for pH and loss on ignition. Wet pH has been done on all 1999 soil samples, dry pH on 75%
Mar 99	Fieldwork summary tables and chemical properties. Scoping study to the Environment Agency	Fieldwork tables have been completed. Scoping study submitted to the EA.
Every 3 months from Feb 99	Progress reports to the EA	Report 1 - Submitted Feb 1999 Report 2 - Submitted May 1999 Report 3 - Submitted July 1999
May 2000	Soil acidity database	pH measurements completed on all 1998 soil samples. All 1998 data checked and entered into database.
May 2000	Soil organic matter and carbon database	LOI measurements completed on all 1998 soil samples. All 1998 data checked and entered into database.
Jan 2001	Soil biota database	All biota samples from 1998 field season extracted/stored for analyses. QA and QC procedures established. BIOLOG completed on 45% of samples.
Jan 2001	Organics database	All organics samples from 1998 field season stored for analyses. Analyses list and procedures agreed with the EA. Sub-set analyses initiated.
Jan 2001	Heavy metal database	All soil samples from 1998 field season prepared and stored for analyses. Analyses list and procedures agreed with the EA. Sub-set analyses initiated.
Jan 2001	Draft Technical Report	-
Jan 2001	Draft Project Report	-
Mar 2001	Final Technical Report	-

PROGRESS IN RELATION TO MILESTONES - CALLUNA

Date of Milestone	Description of Milestone	Progress
Mar 1998	Finalise sampling strategy, develop sampling and analytical procedures	Completed
Oct 1998	Complete field sampling; progress report to Air Quality Directorate	Report submitted in Nov 1998
Mar 1999	Report to Air Quality Division; complete chemical analysis	Work is ahead of schedule; analysis is completed for N and C and additional analyses are being carried out for P, K and Ca.
Dec 1999	Complete chemical analysis of 1999 samples	Additional samples air dried and awaiting processing
Dec 1999	Progress Report to Air Quality Division; complete data interpretation	-

Module title: Module 7 – Land Cover Map 2000		
Funded by: DETR, MAFF, NAW, CCW, EA, SNH, SE, EHS, DANI, OSNI (data supply) and ITE(NERC)		
Module leader (s): R. M. Fuller		
Start date: Apr 1998	**End date:** Mar 2001	**Period covered by progress report:** Sept - Dec 1999

OBJECTIVES

- To undertake a census of the land cover/widespread habitats of the United Kingdom at the turn of the Millenium
- To apply the best appropriate satellite imagery and automated image processing techniques in order to achieve a classification accuracy of 90% for target classes
- To produce and make available, under licence, a range of geographically referenced data outputs on land cover characteristics, tailored to Consortium needs
- To calibrate and validate satellite-derived classifications against ground reference data, published results of the correspondence analyses and provide a guide to their interpretation

SUMMARY OF PROGRESS

- *Early procedural developments are now operational. Laser-Scan's Unix version of the prototype segmentation software is in routine use. Edge-matching procedures have been developed, tested and made operational in the last quarter.*
- *For Northern Ireland, ITE has investigated use Ordnance Survey of Northern Ireland (OSNI) vector data. However, OSNI parcel sizes are generally too small for Landsat spatial resolutions. Acquisitions of high resolution images have been too poor to consider image sharpening (as in Jersey (Smith & Fuller 1998)). Northern Ireland will thus be mapped using the same segmentation process as for the rest of the UK, with the option of attaching land parcel labels to the OSNI polygons, once the classification is complete.*
- *Image searches for the UK show coverage is near complete, though the estimated number of scene-pairs required, to compensate for part-clouded scenes, has increased from 25 to 37. Images have been ordered offering complete coverage of England, Wales, Northern Ireland and southern Scotland. Northern Scotland will require new winter acquisitions.*
- *Slight changes have been made to LCM2000 target classes, subclasses and variants and their relation to widespread Broad Habitats. The only discrepancies were those anticipated in the original Specification; and they will have negligible impacts on overall accuracy.*
- Field reconnaissance data, collected in 1998-9, record so far 83 thematic subclasses, bringing overall coverage to *c.* 85% of the UK.
- The data are being used to train the classifier, with field-mapped land parcels being identified on segmented images as training polygons, objectively based on the segments.
- Software developed by ITE is being used to review training areas, displaying image 'chips' to show the quality of the remotely sensed data in each training area. The operator compares the spectral signatures of training areas, defines spectral subclasses, rejects odd examples, and selects and flags training polygons.
- Classification is using the training polygons to interrogate the parent image to derive statistical measures for reflectances in each chosen band and for each spectral subclass. CLEVER-Mapping uses a shrinking procedure when extracting raster data for polygons, to avoid edge pixels and ensure the use of 'pure' core pixels of a cover type.
- The classification uses a maximum likelihood algorithm using polygon mean statistics to select the most likely class in statistical terms for each parcel. CLEVER-Mapping in IGIS records the probabilities for the top five subclass options.
- The parcel structure of the database is being exploited to 'roll over' the classification results from one scene onto an overlapping unclassified neighbour, by automatically identifying and labelling equivalent polygons on the new image. The data review procedure ensures that the training set matches standards which an operator would apply.
- A combination of external data, internal context, plus the class probabilities, is being used in knowledge-based correction.
- Per-pixel classifications record the natural heterogeneity associated with polygons.

- Procedures for validation have been proposed and await delivery of digitised field data on Broad Habitat classes.
- Initial classifications of widespread Broad Habitats have shown that, in principle, the Broad Habitat classification can be achieved very successfully, with further sub-division of classes to meet wider user objectives. Checks show an accuracy of *c.* 90%, based on Broad habitats, assessed relative to training polygons.
- *Currently, around 20% of GB has been fully classified, 10% has undergone training and preliminary classification, a further 20 % is at the end of the pre-processing phase and 10% is entering pre-processing. The CS2000 web site is being used to keep users informed of progress.*
- *Due to the increased number of scene pairs, the schedule and milestones have been revised. Production will initially concentrate on England and Wales, where full image coverage is already available, and this will be processed by the time of the launch (November 2000). It is intended by then that processing will have classified at least 95% of the UK (i.e. with only odd infill for cloud required). The end of March 2001 will be the deadline for final deliverables for the entire UK.*
- *It is however expected that the processing rate will continue to improve. A fourth workstation and Laser-Scan IGIS licence is to be installed at ITE Monks Wood, quadrupling the original production capabilities. Computer configurations have been improved to speed access and processing times. There are more staff working on LCM2000 now than at any previous time. Processes have been streamlined and automated. It is hoped that coverage can in fact be completed by the time of the launch.*
- *Despite problems with cloud cover, which have increased by 50% the potential size of the processing task, LCM2000 is generally progressing well. LCM2000 summer-winter image cover is already potentially about 95%. All significant production issues have also been fully addressed.* Broad Habitats have been shown generally to be mappable and with the target 90% accuracy.

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Fuller, R.M., Smith, G.M. & Hill, R.A., 1999. *Countryside Survey 2000. Land Cover Map 2000. The Land Cover Map Of Northern Ireland. An Extension To Land Cover Map 2000. Preliminary Report.* Unpublished ITE report to the Northern Ireland Members of LCM2000 Consortium (and provided to the full LCM2000 UK Consortium).
Fuller, R.M., Smith, G.M., Hill, R.A., Thomson, A.G. & Gerard F.F. 1998. Module 7. Land Cover Map 2000. In: Hornung, M. (ed.) *Countryside Survey 2000 First Integrated Progress Report.* Unpublished ITE report to the DETR.
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Fuller R.M., Smith, G.M., Sanderson, J.M., Hill, R.A., Thomson, A.G. & Hall, M.W. 1999. *Countryside Survey 2000. Module 7. Land Cover Map 2000. Seventh Quarterly Progress Report, CSLCM/Prog7.*

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	**Description of Milestone**	**Progress**
Sep 1998	Interim report 1 – Image acquisitions assessed, ground reconnaissance completed for 4 scene pairs	Completed
Mar 1999	Interim report 2 – Mapping completed for 6 scene pairs, Winter 1998-99 image search completed.	Completed
Sep 1999	*Routine production completed for 15% of UK, 10% under classification, with a further 25% in pre-processing phases; image acquisitions year 2 assessed; 85% of ground reconnaissance completed, validation tests outlined and reported, reporting categories updated, six-monthly consortium meeting held.*	*Completed*
Mar 2000	*Interim Report 4 – Routine production completed for 50% of UK; validation methods implemented in England and Wales; Scottish winter 1999-2000 images assessed; change detection evaluated with recommendations; test GIS coverages and CIS datasets delivered; draft material provided for summary report; six monthly consortium meeting held.*	-
Sep 2000	*Analysis completed. Production completed for 80% of UK; ground reconnaissance completed; validation / calibration for England / Wales completed; final provision of data for summary report, infill-image acquisitions completed, six monthly progress meeting.*	-
Nov 2000	*Draft Final Report. Production completed for 95% of UK, launch material prepared / presented. Scottish validation underway; Northern Ireland validation planned.*	-
March 2001	*Final report completed and data delivery completed. Delivery of GIS data, derived products generated (1 km square/CIS summary data), national and regional statistics, report approved for publication.*	-

Module title: Module 8 - Airborne Scanner Applications		
Funded by: DETR and ITE (NERC); data contributed by EA		
Module leader (s): R. A. Hill & R. M. Fuller		
Start date: Apr 98	**End date:** Mar 2001	**Period covered by progress report:** to end Dec 1999

OBJECTIVES

- Evaluate the use of airborne scanning (CASI, LIDAR) to measure the extent and identify the spatial patterns of land cover, linear landscape features and widespread habitats in example survey squares;
- Derive accurate height information, using LIDAR, which would allow definition of slope, run-off patterns, identification and measurement of individual trees, hedgerows and ditches and help in the textural identification of areas of semi-natural vegetation.
- Assess the extent to which CASI and LIDAR information can be used to supplement the CS2000 field survey for the landscapes surrounding the example squares so that patterns observed within the squares can be placed in their wider landscape context;
- Compare the CASI and LIDAR imagery with the satellite data and resulting products, to assess the value that the higher resolution can contribute to synoptic surveys of the countryside.
- Assess the feasibility and accuracy of detecting landscape change using CASI and LIDAR information and assess how the airborne sensors may be used in conjunction with field survey and satellite remote sensing in future re-surveys.
- Evaluate the accuracy of methods and above products in the survey of independent examples of squares (for which ground reference data are unseen).

SUMMARY OF PROGRESS

- CASI and LIDAR data were collected during the summer of 1998 under standard Environment Agency operating conditions.
- A seven-stage data processing flow-line was developed and tested using the data. This involved: data import and error detection, cloud and shadow masking, normalisation, geometric and topographic correction, image segmentation and object-oriented classification.
- Trial analyses of image segmentation and object-oriented classification using test sections of integrated CASI and LIDAR data have demonstrated promising results (presented at the Remote Sensing Society 1999 conference in September (Hill & Veitch 1999)).
- However, it became apparent that the exacting nature of the Countryside Survey made new demands of the data, exceeding those of normal EA operations. As a result, all eight sites were re-flown with both the CASI and LIDAR instruments during summer 1999.
- Pre-processing of the 1999 CASI data at the EA has involved roll-correction only, for flightlines covering the Arable, Pastoral, and Marginal squares. This was because a problem in the Itres 'geocor' software causes data shifts in the processed CASI imagery which make integration of CASI and LIDAR difficult. Upland squares were given the higher order geometric conversion, as conventional geometric correction of images can be near impossible in upland areas where fewer prominent landmarks (e.g. field boundaries, crossroads) are found.
- The 1999 CASI data have been delivered to ITE and assessed. The atmospheric quality is excellent. The geometric quality is as good as the EA systems will allow. For the Arable, Pastoral and Marginal sites, the CASI data contain residual geometric distortions where aircraft roll has been either under- or over-compensated. In addition, geometric distortions also result from underlying topography, which has not been accounted for in the pre-processing. For the two Upland sites, the higher level processing has dealt with these but introduced additional geometric errors by causing data shifts which are more severe for Square 1214 than for Square 692.
- The CASI data for all eight sites will need to be registered to the LIDAR data *by a process of 'rubber sheeting'. Although this manual approach can achieve considerable success, removing even severe distortions, it is an extremely time-consuming process.* Therefore, it will not be possible to achieve the complete data integration for 3 km x 3 km areas for all eight sites under present project outlines.
- *The LIDAR data have been delivered to ITE, and used in the trial registration of CASI data for Arable square 180.*

- The various quality issues concerning the CASI and LIDAR data sets have delayed aspects of processing for Module 8 by approximately 1 year. Moreover, *90 days* of the available 240 HSO research days have been used to-date.
- The implications of the data integration difficulties and time constraints are that the methods of analysis, the intended outputs and the timescale *are being reconsidered.*
- *A renewed timetable of analysis and outputs has been drafted in a revised project proposal which is currently being considered by the EA and DETR before being finalised.*

REPORTS

Fuller, R.M., Hill, R.A., & Veitch N. 1998. Airborne Scanner Applications: Classification of airborne CASI and LIDAR data of selected CS2000 sample squares. First Interim Report, CSCL/Int1.
Hill, R.A., Fuller, R.M., and Veitch, N., 1998. Airborne Scanner Applications: Classification of airborne CASI and LIDAR data of selected CS2000 sample squares. Second Interim Report, CSCL/Int.2.
Hill, R.A., Fuller, R.M., and Veitch, N., 1999. Airborne Scanner Applications: Classification of airborne CASI and LIDAR data of selected CS2000 sample squares. Third Interim Report, CSCL/Int.3.
Hill R. A. & Veitch N. 1999. Integrated ***CASI*** – LIDAR data for land-cover classification'. *Proceedings of the 25 th Annual Conference of the Remote Sensing Society,* 8-10 September 1999, Cardiff.
Hill, R.A., Fuller, R.M., & Veitch N., 1999 - draft. CS2000 Project Specification Module 8: Airborne Scanner Applications - classification of airborne casi and LIDAR data of selected CS2000 sample squares - a revised joint proposal.

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	**Description of Milestone**	**Progress**
Jun 1998	Interim Report 1 – Finalised site selection and instrumentation	Completed and delivered.
Nov 1998	Interim report 2 – Outcome of data collection operations and proposed analysis	Completed and delivered.
Dec 1998	Pre-processing – Production of digital terrain maps and CASI colour images	Preliminary outputs but full production awaiting new LIDAR acquisitions.
May 1999	Interim report 3 – Progress with developments and analyses	Completed and delivered.
Sep 1999	Draft scientific paper – technical evaluation	- RSS Abstract published but full paper awaits new analyses.
Sep 1999	Draft final report – Summary report and recommendations	- Timescale to be re-assessed following replacement data acquisitions
Oct 1999	Final report – delivered to DETR, ready for publication	-
Late 1999	Published report – to be agreed with DETR	-

Module title: Module 10 – Environmental Change Network Link		
Funded by: DETR and ITE (NERC)		
Module leader (s): M. D. Morecroft		
Start date: Jan 1998	**End date:** Nov 2000	**Period covered by progress report:** up to Dec. 1999

OBJECTIVES

- To repeat vegetation monitoring undertaken at ECN sites in 1998 and 1999 using protocols compatible with CS2000;
- To determine the relationship observed between the annual fluctuations in vegetation at ECN sites and prevailing weather conditions;
- To assess the extent to which vegetation monitoring in CS2000 is affected by year-to-year variations in weather, and;
- To review the protocols of vegetation monitoring at ECN sites with respect to applications in countryside Survey and to make recommendations for the long-term adoptions of such monitoring as a standard requirement for ECN sites.

SUMMARY OF PROGRESS

- A progress report was submitted to DETR in Feb 1999. A supplementary report on strategy for data analysis was submitted in June 1999 (the main points are summarised below).
- The field survey for 1999 was carried out between mid June and the end of August in the same way as for 1998, using the same surveyors. As before, staff at each ECN site were responsible for marking plots and facilitating the surveyors visits. All planned plots were successfully recorded according to the agreed schedule. Field recording sheets for 3 of the 10 sites have been received and the data entered. Recording sheets for the remaining sites are expected to be returned by the surveyors during September and data input will start straight away.
- Data analysis will be carried out by Dr. Andy Scott and Dr. Mike Morecroft and is planned to take place in October and November 1999. Indicators of Botanical Diversity (IBDs) derived from the data will be individually analysed with the following aims: (1) to quantify year to year variability, (2) to identify relationships between IBD values and weather variables and (3) to assess the effect of year to year variations on the results of CS2000. The analysis will be primarily stratified according to CVS aggregate vegetation classes. Final details of the analysis will be agreed with members of the CS2000 analysis group to ensure compatibility of the results. In the light of the analysis, recommendations will be made for future monitoring studies to address this issue, as requested by the DETR.
- *All data has been entered into the ECN database - December 1999.*
- *Validation of data has been completed - December 1999.*
- *Following consultation, a suitable methodology for analysis has been defined. Pre-processing of data is being carried out to ensure compatibility with CS2000 data.*
- *Analysis has now started and should be complete by mid- or end of January 2000.*

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	Description of Milestone	Progress
Dec 1998	Results from the 1998 survey and illustration of use.	Submitted to DETR Feb 1999.
Jan 2000	Technical evaluation of the methodology; results from 1998-1999 surveys, interpretation in relation to CS2000: proposals for continued monitoring.	-
Mar 2000	Draft final report by end Jan 2000; report ready for publication by end March 2000	-

Module title: Module 11 – Northern Ireland Countryside Survey Link		
Funded by: DETR and ITE (NERC)		
Module leader (s): R. G. H. Bunce		
Start date: Jan 1998	**End date:** Nov 2000	**Period covered by progress report:** up to December 1999

OBJECTIVES

- To ensure co-ordination of CS2000 with the Northern Ireland Countryside Survey (NICS).
- To develop compatible methodologies within the two surveys.
- To produce tables of correspondence between NICS field categories and Broad Habitats.
- To develop a statistical procedure for joint reporting of Broad Habitats by combining estimates from Northern Ireland with those of GB to produce UK statistics.
- *To make recommendations for future integration of NICS with CS2000.*

SUMMARY OF PROGRESS UNTIL DECEMBER 1999

- *The module is on schedule but the final report has been postponed from December 1999 to January 2000.*
- The first UK figures for a land cover type, broadleaved woodland, have been calculated, with an error term, by combining GB and NI data. The procedure can now be applied to all other cover types for which GB and NI data is available.
- Under a separate but related contract, with the Environment Heritage, Northern Ireland Dr Bunce has supervised a quality assurance exercise for the Northern Ireland Countryside Survey 20000 (NICS). This showed that correspondence between the QA and NICS at the UK Broad Habitat level was 90.7%. The main reason for disagreement between the two surveys was the different interpretations in the field of land cover criteria (4.9%). Categorical error only accounted for 0.9% of the disagreements. At the NICS level, correspondence of land cover types between QA and NICS was 70.4%. Of the disagreements, interpretation of land cover criteria accounted for 14.4%; splitting of one land cover type into two others accounted for 4.4%; seasonal changes for 3.6%; difficulty in identification of Lolium perenne varieties for 1.3% and categorical error for 4.0%.
- Within woodland cover types, the correspondence between QA and NICS was 88.9%; within agricultural land cover types 69.8% and within landscape land cover types 81.3%. The main reason for the differences was interpretation of land cover criteria between closely related types.
- Correspondence between NICS and QA of boundary types was 77.0%. Of then disagreements, interpretation of boundary criteria accounted for 13.0%, seasonally related differences for 2.0%, other reasons for 3.0% and categorical error for 5.0%.
- Although the sample was small, it was adequate to draw valid conclusions about the reliability of the data, which is comparable to other surveys. The QA confirmed the reliability of the mapping procedure and showed that the results will be robust. Finally, the high correspondence at the Broad habitat level shows the validity of using the categories for UK reporting.
- *Final allocations of NICS field categories have been made to the most recent list of Broad Habitats provided by JNCC.*
- *The framework for joint reporting is described in the draft final report based on two environmental zones NI7 and NI8, comparable to zones 4 and 5 for Scotland. The deliverables for stock, change and associated errors that can be produced for Broad Habitats for the UK have been defined.*
- *Following the NICS Steering Group Meeting on December 14th 1999 it was recommended that Dr Alan Cooper (University of Ulster) should be represented on the Draft Group for the Launch Report to provide the necessary ecological comments on the relationship between NI and GB.*

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	**Description of Milestone**	**Progress**
Mar 1998	Interim report 1 – Comparability of survey protocols.	Report submitted on schedule.
Apr 1999	Interim report 2 – Comparability of analytical procedures and recommendations for joint reporting.	The work programme for period to April 1999 is completed.
Oct 1999	Draft final report.	*Postponed until December 1999*
Dec 1999	Final report.	*Postponed until January 2000*
Apr 2000	Final report published.	-

Module title: Module 13 - Scientific Support and Information Management		
Funded by: DETR and ITE (NERC)		
Module leader (s): J. W. Watkins		
Start date: Jan 1998	**End date:** Dec 2001	**Period covered by progress report:** up to Dec 1999

OBJECTIVES

- To facilitate access to data derived from CS2000 and earlier surveys for the Department and the Department's contractors or collaborators; to advise about data characteristics and quality; and, to service ad hoc requests for data and analyses (see CS2000 Data Access Policy).
- To design, implement and manage a database that is capable of integrating and linking the information collected in each of the CS2000 modules and earlier surveys.
- To support the synthesis and dissemination of outputs from all CS2000 modules; to produce data and other materials required for electronic transmission of information via the Internet or the Countryside Information System (CIS), including the National Biodiversity Network; to provide information for the production of the CS2000 Summary Report.
- To provide assistance and advice to users of CS2000 data and to provide CS2000 data to third parties, subject to agreed policies for access to data.
- To develop and implement a dissemination strategy.

SUMMARY OF PROGRESS

- A CS2000 Data User Group meeting was held on the 26th March 1999 to publicise the data products that Module 13 will be producing. One outcome of this meeting was to arrange a workshop on more specific details and examples of the use of CS2000 data. This has been scheduled for Autumn 1999.
- The new IFE Data Manager, Mike Gravelle, visited Merlewood to discuss IFE work on Module 13. An area of work was identified to connect Module 1 and Module 2 analyses. IFE have now completed entry and validation of the RHS survey into an interim database.
- Capture of new survey data is in progress and is closely associated with the data validation work being carried out in specific modules, especially module 1.
- Development of the WWW interface to the CS2000 Data Catalogue is proceeding at ITE Bangor. This has involved the re-scheduling of time to allow Adrian Thomas to carry out this work and redress staff changes.
- The Data Dissemination report has been completed in draft form and will be circulated for comment.
- A report on hedgerow species richness in Scotland has been produced under the scientific support programme. A timetable for further scientific support work is being drawn up.
- *A report was produced under the scientific support programme comparing methods for producing preliminary estimates of Broad Habitat extents from 1990 data. The preliminary estimates were supplied to the EA.*
- *Work has continued on populating the CIDS database with data mainly from Module 1 and overseeing the validation of survey data in intermediate databases.*
- *The development of WWW interfaces to the CIDS data catalogue in progressing at ITE Bangor.*

REPORTS

Moffat TJ, Watkins JW and Symes K, Oct 1998. Countryside Survey 2000 Integrated Data System (CIDS)
Barr CJ, Gillespie MK and Watkins JW Sept 1999. An analysis of CS1990 data in relation to species-rich hedgerows in Scotland.
Moffat TJ Oct 1999. CS2000 Data Dissemination Strategy
Barr CJ, Clarke R, Howard DC Nov 1999 Preliminary Estimates of Broad Habitat Extent derived from Countryside Survey 1990 Data

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	**Description of Milestone**	**Progress**
Feb 1998	Ad hoc report – Evaluation of hedgerow criteria	Discussion document submitted to DETR.
Jun 1998	Interim report 1 – Data model and database structure	Submitted in Oct 1998.
Dec 1998	Ad hoc report – Hedgerow criteria	Covered by discussions with DETR.
Apr 1999	Interim report 2 – Data dissemination strategy	*Completed.*
Feb 2000	Preliminary data	-
Nov 2000	Interim report 3 – Catalogue of data and data products	-
Nov 2000 to Dec 2001	Production, dissemination and support of data products	-
Jun 2001	Draft final report	-
Sep 2001	Final report	-
Dec 2001	Final report published	-

Module title: Module 16 - Programme Management, Co-ordination and Policy Liasion		
Funded by: DETR and ITE (NERC)		
Module leader (s): M. Hornung		
Start date: Jan 1998	**End date:** Feb 2002	**Period covered by progress report:** To end Nov 1999

OBJECTIVES

- To liase with policy customers and to draw out from the results the main points of significance for countryside and wildlife policies.
- To be aware of the developing policy agenda and other related research and monitoring activities and ensure that the presentation of results is responsive to changing demands.
- To liase between NERC, DETR, the members of the CS2000 Joint Management Team (JMT) and the sponsors of CS2000 modules, to ensure the overall co-ordination of the work programme.
- To provide secretarial functions for the CS2000 Joint Management Team and Advisory group.
- To develop awareness amongst the user community of progress in CS2000 through the production of a regular newsletter and maintenance of a Web site.
- To develop and promote common reporting approaches and standards for all CS2000 modules and to maintain an overview of all CS2000 outputs and products.
- To identify and promote opportunities for using CS2000 data in consultation with policy customers and other users, including initiatives undertaken as part of the national Biodiversity Network.
- To co-ordinate, edit and produce a summary report on the results of CS2000.

SUMMARY OF PROGRESS

- Discussions have been held with all module leaders at regular intervals
- Tenders covering the work within Modules 3 and 4 were submitted to MAFF in and contracts signed in June. A draft specification and contract has been agreed with the EA to cover their contribution to the Soil Quality work under Module 6. A contract covering the DETR land and Water Directorate's 1998/99 contribution to the Soil Quality work was agreed in August; a contract for the 99/00 and 00/01 is currently under discussion. The contract with Air Quality to cover the DETR Air Quality contribution to the *Calluna* work was signed in September. Contracts with DETR and SNH have been signed with respect to Module 2 and discussions are in progress with EA on the contract covering their input to this module.
- The eighth meeting of the JMT was held at Eland House, London on the 18th November 1998. Documentation for the meeting was prepared and circulated from ITE Merlewood.
- The second issue of the newsletter was released in December 1998 and c. 1000 copies have been distributed.
- The fourth meeting of the Advisory Group was held on the 15th March 1999 at Eland House London. Documentation for the meeting was prepared and forwarded from ITE Merlewood.
- A progress report and forward look was submitted to DETR in late March 1999
- The Reporting Sub-Group met in Eland House London on 28th April 1999. Documentation for the meeting was prepared and forwarded from ITE Merlewood.
- The third issue of the Newsletter was released in June 1999 with c. 1000 copies distributed.
- A meeting was held with module leaders at ITE Monks Wood on 6th July 1999 to discuss scheduling of inputs to the Summary Report and to identify requirements for the flow of data between modules.
- The activities and progress under Phase 1 of the Module were reviewed at a meeting with DETR on 15th July 1999. The meeting used the April report as its basis for discussions. A work programme for Phase 2 of the Module was agreed and a proposal based on this was submitted to DETR. The contract covering Phase 2 was agreed in late July
- A policy advisor, Dr David Briggs (University College, Northampton) has been added to the Module 16 team under phase 2 of the Module, and will work in collaboration with Dr Roy Haines-Young.
- A contract for the continuation of the Soil Quality work under Module 6 has been agreed with the EA.
- A review of the Web site is in progress following discussions with DETR.
- *The variation to contract to cover Phase 2 of Module 16 was agreed and signed in May 1999.*
- *The fifth meeting of the Advisory Group was held on 29th September 1999 at Eland House.*
- *The division of duties, method of working and timetable for the consultations by the policy and independent advisers have been agreed with DETR and the programme of consultations has begun.*

- *The fourth issue of the Newsletter was released in November 1999 with c. 1000 copies distributed.*
- *The review of the Web site has been completed and edits as agreed with DETR implemented.*
- *The timetable for the Summary Report, reporting procedures and dissemination of results were discussed and agreed at a meeting of selected module leaders with DETR at a meeting in House on the 30 November.*

REPORTS

Stark GJ. Apr 1998. Countryside Survey 2000 News Issue 1
Hornung, M. June 1998. Countryside Survey 2000 First Integrated Progress Report.
Stark GJ. Dec 1998. Countryside Survey 2000 News Issue 2
Hornung, M. Jan 1999. Countryside Survey 2000 Second Integrated Progress Report.
Hornung M, Stark, G, & Haines-Young R., March 1999 Countryside Survey 2000, Module 16: Progress and Forward Look
Stark G. June 1999. Countryside Survey News, Issue 3
Wallis, S. November 1999. Countryside Survey News, Issue 4.

PROGRESS IN RELATION TO MILESTONES

Date of Milestone	**Description of Milestone**	**Progress**
Mar 1998	Launch of Newsletter and Web Site	The 1st newsletter was produced in April 1998, Web site launched in July 1998
Jun 1998	Integrated progress report	Submitted on schedule
Nov 1998	Integrated progress report, second newsletter	Submitted in January, but second newsletter Dec 1998.
Mar 1999	Module review/Interim report – Evaluation of progress and requirements for remainder of contract, third newsletter	Review completed. Phase 2 of Module 16 defined and agreed with DETR. Contract for Phase 2 signed. Third newsletter released June 1999
Nov 1999	Progress report – Content, style and data requirements for Summary Report, common reporting requirements, fourth newsletter	*Contents for Summary Report, schedule and reporting procedures and formats agreed. Fourth newsletter released.*
May 2000	Draft Summary Report, fifth newsletter	-
Sep 2000	Completed Summary Report	-
Nov 2000	Summary Report Published, sixth newsletter	-
Mar 2001	Integrated progress report, seventh newsletter	-
Jun 2001	Away Day – Discussion of results and policy implications	-
Oct 2001	Draft final report – policy responses and feedback	-
Nov 2001	Integrated progress report, eighth newsletter	-
Dec 2001	Final report	-
Feb 2002	Final report published	-

Annex 2

Minutes of the first meeting of the Reporting Sub-group,
28th April 1999

COUNTRYSIDE SURVEY 2000 REPORTING SUB-GROUP
Minutes of the meeting held on 28TH April 1999 at the offices of the Department of the Environment, Transport and the Regions, Eland House, London.

Present were:
Mr C.J. Barr (ITE) CJB
Dr C. Burrows (CCW) CB
Dr P. Costigan (MAFF) PC
Mr C. Easton (SO) CE (items 1 to 5)
Mr M.T. Furse (IFE) MTF
Dr R. Haines-Young (NU) RHY
Dr J. Hopkins (EN) JH
Prof M. Hornung (ITE) MH
Mr J. Phillips (WO) JP
Miss C. Somper (CA) CS
Mr G.J. Stark (ITE) GJS, *Secretary*
Dr A.P. Stott (DETR) APS, *Chair*
Dr C. Tuckett (EA) CT (items 1 to 8)

Apologies were received from:
Mr J. Custance (DETR)
Dr L. Howe (CCW)
Dr J. Miles (SO)

1. Welcome and introductions

1.1 APS welcomed members to the first meeting of the CS2000 reporting sub-group (RSG).

2. Membership and remit of the reporting sub-group

2.1 APS tabled draft terms of reference for the RSG (csrsg1/1). An additional item, to advise on scheduling, should be incorporated into the remit and reference to DETR/NERC in item 2 should be altered to refer to 'sponsors' of the survey. **Further written comments should be submitted to APS who would circulate amended terms of reference to the group.** *APS*

3. Policy context

3.1 APS tabled some examples of policy initiatives to which the CS approach has or might potentially have relevance (csrsg1/2). Further development of such a list would enable co-ordination of CS2000 reporting with coincident policy initiatives and inform the writing of the summary report. Suggestions of policy relevant initiatives/ bodies that should be contacted additional to the list tabled by APS were: Countryside Agency data requirement review; MAFF Foresight; Environment Agency initatives; English Natrue review of SSSI legislation; European Agency and Topic Centre; Millennium report; and, Biodiversity Information Group. Discussions between DETR and ITE over the future work programme for Module 16 had concluded that additional policy support would be required and this would include maintaining a watching brief on policy initiatives. The basic information requirement would be a brief description of the initiative, its timetable and a contact point. **In the meantime, GJS would collate contributions from RSG members.** **All to provide information to GJS**

4. Summary of outputs

4.1 MH tabled a timetable for production of summary data products and matrix of dependencies between these data products (csrsg1/3). **MH would prepare a more detailed breakdown of data products and resolution of conflicts in data dependencies and circulate this to the RSG.** *The availability of CS2000 data could impact on policy announcements and so statements about the timetable for data products should make clear the point at which they are available for general release. The release of data products should be in a controlled manner but need not be a unified launch for the whole programme.* **MH**

5. Structure/content of summary report

5.1 RHY outlined a proposal for the structure of the summary report as described in his paper circulated prior to the meeting (csrsg1/4).

5.2 The inclusion of detailed descriptions of methodologies was not appropriate for the summary report but the report would need to make reference to them. Methodologies would be fully documented in the separate module reports, though these would not be available until after publication of the summary report. **Earlier production of methodologies should be discussed with module leaders and the possibility of a Web-based dissemination strategy, including a discussion group forum, would be investigated by ITE.** This could be associated with the metadata for the data catalogue proposed in Module 13. *ITE*

5.3 Where results highlighted in the summary report have clear policy significance, such as highlighting a decline in a particular habitat, supporting methodology and data should be made available to all interested parties to ensure a balanced debate. The current schedule of work includes production of full technical reports later than the summary report. Special arrangements might be required to deal with controversial issues. *The timetable for production of the summary report should allow for reaction of policy customers to issues highlighted by the results.*

5.4 The term 'summary report' suggests summary of all results when in fact all results will not be available at the time of publication. The report is in effect a 'way in' to the programme and **ITE/DETR should consider referring to it as an 'overview report'.** **ITE/ DETR**

5.5 The preparation of briefing materials should be included in the work programme, eg 10 key points to emerge from the results. **ITE/ DETR**

5.6 There will be overlap between the results of CS2000 and other sources of information, possibly contradictory. *The scope of the summary report should be restricted to the results of the survey, though reference should be made to other sources where these help to clarify interpretation of the results.*

5.7 DETR will be responsible for the design and production of the summary report. The RSG and report editors should advise on design elements.

5.8 RHY/ITE would incorporate the recommendations made by the RSG in the preparation of a paper establishing the principles for the summary report and developing a more detailed specification for contributions from module leaders. **RHY/ ITE**

ENVIRONMENTAL REGIONS

5.9 Previously the AG had been asked to comment on proposals made by ITE for

spatial analysis using ITE land classes. CJB presented a proposal for 6 Environmental Regions (3 in England/Wales and 3 in Scotland) taking into account the recommendations made by the AG. The proposal was accepted by the RSG with the provisos that the Scottish Office should be given the opportunity to comment on the proposal and that the naming of regions should be decided in the light of their characterisation. **CJB would circulate a report to the RSG including selection, definition and characterisation of the regions.** The report would include a map showing distribution of sample sites in relation to regions. *CJB*

6. Implications for modular reporting

6.1 EN had recently published a report on Habitat Accounts. A specific recommendation of the report was that further analysis to that planned under the current CS2000 programme should be considered which would aim to develop target values for indicators of the condition of Broad Habitats. **GJS would circulate the report to RSG members.** *GJS*

6.2 Each module is expected to contribute results to the summary report. In the case of Module 1 the output from the analysis phase will be results tables and associated commentaries. These will not be separately available but will be provided to the summary report team and fully reported in the separate Module 1 report. *Close liaison between the summary report and module reports would be required.*

7. Data access issues

7.1 GJS summarised the main points to arise from the Module 13 users workshop held on the 26th March. The workshop was held to seek advice on technical issues relating to data access and the strategy for data dissemination. The data access policy proposed by ITE was broadly endorsed and discussion focussed on refining data products to meet user needs. Specific recommendations were:

- to bring forward production of a data catalogue;
- for the Module 16 policy liaison role to include development of a specification for data products;
- for other organisations to consider inclusion of bespoke analysis of CS2000 data in their forward work programmes;
- to ensure that the data catalogue was compatible with the NBN;
- for promotion of CS2000 as an educational resource to be considered; and,
- to develop greater appreciation amongst the user community of how CS2000 data might be applied through, for example, tutorials and workshops.

The recommendations of the workshop will be incorporated into a report on data dissemination by ITE to DETR.

8. Further work on socio-economic drivers

8.1 APS asked for any further comments on RHY's paper to the AG (csag4/7), which reviewed issues relating to the interpretation of CS2000 results, to be forwarded to RHY ASAP. Once this paper was completed, APS would prepare a specification for work to review drivers likely to have operated between the 1990 and 1998 surveys. *This review would not be confined to agricultural factors.* **APS would circulate this specification for RSG members to comment on.** **APS**

9. Work programme and coordination

9.1 MH tabled a paper allocating provisional responsibilities for tasks involved in the production of the summary report and the scheduling of these tasks (csrsg1/5). **The next input for the RSG would be consideration of the summary report principles and contents paper to be prepared by ITE (item 5.8 above). This would be by correspondence during July.** A revised version of this paper would be tabled at the next meeting of the AG on 29th Sept 1999. **All**

10. Date of next meeting

10.1 The next meeting would be Feb/March 2000 when the first draft of summary report would be available for comment

GJS, 11/5/99.

Annex 3

Minutes of the fifth meeting of the Advisory Group,
29th September 1999.

Countryside Survey 2000, Advisory Group Meeting
Great Minster House, 76 Marsham Street, London, SW1P 4LY
Wednesday 29th September 1999

List of Attendees

Mr C J Barr	ITE	CB
Ms A Baverstock	DETR	AB
Ms M Edmead	DETR	ME
Dr A Ferguson	EA	AF
Dr R Fuller	BTO	RF
Mr R M Fuller	ITE	RMF
Mr M T Furse	IFE	MF
Dr R Gregory	RSPB	RG
Dr R Haines-Young	Nottingham University	RHY
Mr A J Hooper	FRCA	AH
Dr J Hopkins	EN	JH
Prof M Hornung	ITE	MH
Dr L Howe	CCW	LH
Dr T Moffat	ITE	TM
Mr J Phillips	NAFW	JP
Mr R Pritchard	DETR	RP
Dr M Morecroft	ITE	MM
Prof T M Roberts	ITE	TMR
Mr M Sangster	FC	MS
Dr P Saunders	DETR	PS
Mrs C Somper	CA	CS
Dr A P Stott	DETR	AS
Mr I Strachan	JNCC	IS
Mrs S Wallis	ITE	SW
Ms B Worthington	Wildlife & Countryside Link	BW

Apologies were received from:

Dr J Curran	SEPA	
Mr J Custance	DETR	
Dr P Costigan	MAFF	
Ms K Hart	CPRE	
Mr J Harvey	NT	
Prof A Pickering	IFE	
Dr S Webster	DETR	
Dr M Taylor	DETR	MT

Corresponding members: Prof. D Briggs, University College Northampton
Dr L. Firbank, ITE

Agenda item		Action
1.	<u>Welcome etc.</u> Members were welcomed to the meeting, and apologies were presented. Dr R. Fuller (BTO) and Mrs S. Wallis (ITE) were introduced as the leader of the new Module 5, and Secretary to the meeting respectively.	
	Items outstanding from previous minutes (CSAG4). Item 3.4. Co-ordination of land use change statistics, and Item 5.10, the FC's Woodland inventory. AS commented on the need to ensure that action is taken to co-ordinate these outputs with CS2000. Discussion is needed between ITE and (a) Bob Garland (DETR), and (b) the FC.	ITE. MS / CB.
	Item 5.4 Drivers of Countryside change, and Item 5.9, Integration of field and satellite data. AS has now received the final report on the CS2000 scoping study, which includes consideration of integration and of policy drivers. The report will be circulated to members shortly.	AS/SW.
2.	<u>Overall Progress</u>. MH presented the Module reports and summarised progress, presenting GANNT charts to show milestones and progress completed.	
3.	<u>Module Progress reports</u>	
3.1	*Modules 1, 3 and 4 (Field Survey).* CB reported that the Field Survey has been completed, and vegetation and spatial data entry completed. A total of 569 squares were surveyed, with 16,718 vegetation plots of which 12,000 were repeat samples from CS1990. For the vegetation data, analysis tools have been developed and analysis initiated; progress is more or less up to date. For the spatial analysis data, validation is in progress, and analysis tool development almost complete. Work has commenced on analysis of spatial data, but progress is a little slower. NB. The EA's request for estimates of Broad Habitats in GB based on 1990 data (paper 5/2 'Broad Habitats' refers), had proved a useful exercise, confirming that past data could be expressed as Broad Habitats.	
3.2	*Module 2.(Freshwaters).* MF outlined the objectives of the Freshwater survey and current progress. 405 squares were sampled, and 90% of samples have been sorted. Conflict for specialist staff time on identification of samples may result in extension of this work into February, but will not affect the reporting schedule. Reporting may need to be compressed to meet Summary Report deadlines. MF described the River Habitat survey's links with measures of human modification of a watercourse, and its link to Environmental Zones and Broad Habitats via land cover effects. This will enable a measure of the biological condition of watercourses. *Comments:* AS asked about delays in identification of samples, and expressed concern over the time-scale of analysis. MF explained that staff effort will be concentrated on producing the key information required for the Summary Report, with more detail following later.	
3.3	*Module 6. (Soils & Calluna).* Presented by MH. A. Soils. 1096 samples have been obtained, and are being analysed for: • invertebrates: extraction is complete and identification is in progress; • microbial communities: on schedule, 45% of 1998 samples completed; • metals & organic analysis: programme finalised with the EA, slightly behind schedule but expected to meet reporting dates.	

B. Calluna. Samples have been obtained from every square containing *Calluna* (total 208 squares), and all chemical analysis is now complete on the 1998 samples. Analyses have been expanded to include P, K, Mg and C. Preliminary examination shows quite a wide range of values of N, with low values of N associated with low N deposition.

3.4 *Module 7 (Land Cover Map 2000).* RMF reported that most of the pre-processing for England and Wales had been completed, and full processing was now complete for East Anglia. Fieldwork is complete as far north as the Scottish Central Lowlands. Examples of the detail obtainable from LCM2000 were shown, and the extensive categories of information available for each land cover parcel. Production is slightly behind schedule (but now accelerating), processing should match the targets. Some imagery is still missing due to bad weather, clouds etc., 'patches' will have to be inserted, which will add to the processing time, but will still fall within financial and time constraints. Imagery for N. Ireland and Shetland will have to be obtained next year. Validation is being carried out utilising the CS1990 procedures; RMF intends to hold a technical workshop on validation before the production phase. Reporting is on target.

Links with the Broad Habitats classification were discussed, and the problems caused by the modifications to the definitions. The module will report by Broad Habitats, and is also deriving data to enable sub-division of the Habitats.

Comments: AS asked IS (JNCC) to confirm the status of the Broad Habitats classification. JNCC will check status and publication date. — IS.

AS enquired whether it was possible to increase processing speeds, in order to meet reporting dates. RMF replied that due to lack of imagery this would be very difficult, but it may be possible to compromise on the nature of the reporting. 100% coverage of UK will not be achievable by April 2000. Due to the 'roll-out' nature of the programme, England & Wales will be completed first, and could be available for reporting, if agreeable to LCM consortium.

DETR wish to consider the implications of this possibility, and its effects on the structure of the Summary Report — RP, AS.

AS asked about the timing of the Technical Workshop with regard to the calibration with field survey data. RMF suggested late autumn 1999.

3.5 *Module 8 (Airborne Scanners).* RMF summarised the problems encountered so far with distortion and geo-correction, and the measures taken to overcome them. Consequently, processing has been delayed, although results so far are very interesting. LIDAR data obtained this year has not yet been delivered so quality is unknown. When the data are checked, RMF will redraft the proposal for DETR and EA's approval, to obtain maximum value from the data in the time available. — RMF

Comments: RP enquired whether resources from Module 8 could be re-deployed in Module 7, to assist processing times. AF replied that, considering their input to the module, the Environment Agency would be disappointed if the analysis work could not be completed.

RP proposed that RMF examine the possibility of redefining Module 8 and re-orientating Module 7, in order to speed processing for Module 7, and complete Module 8 analysis later in the module's lifespan. A new proposal will be needed — RMF, with EA.

JH enquired why technical shortcomings were not identified earlier in the programme. RMF explained the demands of co-registering the datasets, and emphasised the experimental nature of this module

3.6 *Module 10 (Links with ECN).* MM presented the background to the module. Progress is on target, with analysis starting this October/November and draft reporting in January 2000.

3.7 *Module 11 (N. Ireland Links).* MH commented that the aim was to ensure comparable reporting structures and formats between N. Ireland and GB's Broad Habitats. Late finalisation of Broad Habitat definitions could cause problems in this module as well..

3.8 *Module 13 (Scientific Support).* TM summarised progress and presented a draft Data Dissemination Strategy paper. Three levels of access will be provided, and controlled online access into the database will be possible. There will be links with other initiatives (e.g. N. Ireland, NBN), mainly via websites. A workshop will be held later in the year on data products, and potential users will be able to comment on products. Products will be publicized, and searchable data catalogues will be utilized for both the main database and the CIS. Implementation will be via the Environmental Information Centre at ITE Monks Wood, who will also act as guardians of the data after completion of CS2000. Comments on TM's paper were requested (to be forwarded to TM and copied to AS by 31st October). ALL.
CB will act as point of contact for scientific support. All requests should be approved by AS.

4. Northern Ireland Survey. There was no report, due to the unavailability of a N.I. representative.

6. New Modules. (taken before Item 5). AS presented the specification papers for Modules 5 and 14. A summary of Module 5 (Bird Populations and Countryside Change) was given. Dr R Fuller (BTO) will undertake the contract. DETR will establish a steering group. MT/RF
Module 14, Drivers of Countryside Change, is presently out to tender. It will enable reporting in the light of socio-economic influences. Refer to papers tabled.

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5. Module 16 (Programme Management & Policy Co-ordination).

5.1 *Contract variation.* MH outlined the aims of the module, and the work agreed under the contract variation with DETR for the remainder of the project.

5.2 *Independent Advisors.* Prof. D. Briggs (DB) is now working on the project, liaising with groups other than those represented on the Advisory Group. RHY will continue to liaise with those groups represented on the Advisory Group. RHY and DB will hold one-to-one consultations, and an internal workshop in January 2000 with module leaders; and an external workshop with consultees in February. Key policy issues will be identified and reported to DETR. A second series of meetings will be held from late spring 2000 onwards, to explore joint uses and possible future research. They will also produce reports on relevant areas of policy. DB. Contacts to be agreed with AS.

5.3 *Co-ordination.* An assessment has been completed of required data transfers between modules, to identify matches between data outputs and needs, and any mismatches in scheduling. Identification of results definitely available within the time-frame will assist planning of the Summary Report. Attention was turned to identification of links to other external projects such as Atlas 2000 and the FC's Woodland Survey. RHY, DB.
Comments: GP commented that links with policy were crucial, and that the planned exercise could help identify potential players. The reports produced by RHY and DB

could be circulated to the RSG.
JH suggested early release of data to some of the Advisory Group organisations, for assessment. RP felt that although discussion was valuable, early release could have other dangers. CS2000 would be released progressively from November 2000.

5.4 *Newsletter and Website.* SW gave a brief overview of current activities. The next Newsletter is due out in November 1999, the Web-site is currently being revised

7. *Reporting Issues.*

7.1 *Reporting Sub-group (RSG).* Terms of Reference have been established. The group will also consider results as they emerge and consider the scheduling of outputs and relevance to different audiences.

Paper 5/7. Environmental Zones. CB's paper was discussed, and several points noted:

- N. Ireland was not included in the original study remit (as it is not part of the GB Countryside Surveys). Compatability to be discussed with M. Murphy.
- Succinct descriptions and nomenclature are essential;
- Links with Natural Areas or SNH zones might be incorporated, and could be assessed using the Countryside Information System;
- It is desirable for zones to be broadly contiguous in nature across national borders;
- Nomenclature: numbers may be preferable to names for the zones.

RP pointed out that reporting structure was layered as UK, Country, and Broad Habitats. The Environmental Zones were offered as one of several different possible approaches to presenting data, depending on the questions being asked. The RSG were asked to consider the Advisory Group's comments and make recommendations back to the Group. RSG.

Paper 5/8 Circulated for information. SW to re-circulate the latest version.

Paper 5/9. The Summary Report will present, thematically, a first integrated view of CS2000. It will not be possible to present full integration between field survey and LCM2000. It will report around a Broad Habitat framework, showing stock and change from field survey, and particular thematic or regional information from LCM2000. The Report is intended for a wide audience, and will be a stand-alone document giving a picture of the whole project.

Comments: PS recommended that the Report should mention options for other ways of examining the data e.g. coastal zone data. AS to discuss with Kerry Turner re EU reporting. AS.

RP requested that the RSG advise on reporting sequences, and recommend a specification for a 'family ' of reports. The name 'Summary Report' may be misleading for an introductory report which presents preliminary results, highlights and headlines. RSG.

MS suggested the use of CD-ROM's for intermediate users.

RP and TMR emphasised the importance of an UK-wide view, even if there may be a subsequent separate Report on Scotland, and that sub-divisions of the UK would be needed to allow key changes to be identified.

Comment: TMR said that in CS1990 there had been no reporting on the spatial dynamics of change, which would have helped understanding of results. CB confirmed that spatial variation could be identified between Broad Habitat, land class

	or regions, and between countries.	
	Structure of reporting. The draft structure will be taken forward and co-ordinated by the Module 16 leader (MH). It will be drafted around results, tables and commentaries provided by Module leaders, with plotted outputs and/or data from Module 7. The drafting subgroup (RHY- lead author, with MH, DB and L. Firbank) will collate the tables and summaries, select those for inclusion and write the report, within the agreed timetable. The potential for progressive delivery of results and commentaries was discussed, ITE will look into the possibilities of this option.	MH, CB.
7.2	*Policy links.* TMR asked whether, during the discussion of results as they become available, the RSG would act as a link to policy groups, advising on appropriate presentation. Different results will have different degrees of importance to the various sponsors; and discussion may be necessary with the sponsors. RP agreed to consider this issue and that of confidentiality of data, findings and disclosures.	RP.
	Comments: RG asked whether there was the possibility of conflict between the initial Summary Report and subsequent scientific analysis. AB expressed concern over links with the publication of the Rural White Paper due next year.	
Any other business	IS had contacted JNCC during the meeting (see Item 3.4), and reported that the Broad Habitat classification is now fixed, with no further changes. Terrestrial and freshwater definitions are almost complete. IS will consult with CB over correlation with CS2000 and clarify problems of interpretation as a matter of urgency.	IS with CB.
	MF informed the meeting that River Habitat Survey reports were now available.	
Next Meeting	The next meeting will be held at the end of February/ early March, and will be concerned mainly with a review of progress. AS will finalise the date and inform the Secretariat.	AS.
	The meeting closed at 4pm.	

Annex 4

Timetable for preparation of the Summary Report

30.9.99	Report structure finalised and approved
30.11.99	Drafting sub-group agrees division of duties and *modus operandi*, begins drafting background material
31.01.0	First draft of background material
30.04.0	Module leaders submit tables of results plus commentaries to drafting sub-group
31.05.0	drafting sub-group identifies results 'tables' for inclusion in report
30.06.0	First draft available for comment
31.07.0	Illustrative graphics from LCM2000 submitted to drafting sub-group
	Method books/field manuals 'posted' on the web site
30.08.0	Results and tables from LCM2000 to drafting sub-group
14.09.0	Drafting sub-group completes review of field survey LCM2000 results – decision on whether to include LCM2000 results
30.09.0	Revised version of report, integration of text and graphics
30.10.00	Report submitted to printers

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