

## **Part 3: Environmental Accounts and Data Availability**

### ***Introduction***

- 3.1 An important feature of the accounting concept is that it provides a framework for the integration and interpretation of different kinds of data. As a result, environmental accounts can support strategic decisions because they allow users to gain an overview of available information. Environmental accounts may be useful to organisations, like English Nature, which need to consider information from many different sources to help develop and appraise policy. Given the potential benefits of the approach we must consider whether sufficient data are available to allow their preparation.
- 3.2 The specification for this project asked us to consider the suitability of CS2000 data for developing landscape and habitat accounts by EN. Although it would be limiting, in the long term, to base accounts in a single data source, given the scope and character of the information from Countryside Survey 2000 (CS2000) an evaluation of the suitability of these data is a necessary first step in the context of the present initiative.
- 3.3 In this Part of our Report we provide an overview and evaluation the outputs from CS2000 that are relevant in an accounting context. We conclude with a brief review of other data sets that would, in the longer term, be relevant to the development of a comprehensive set of environmental accounts.

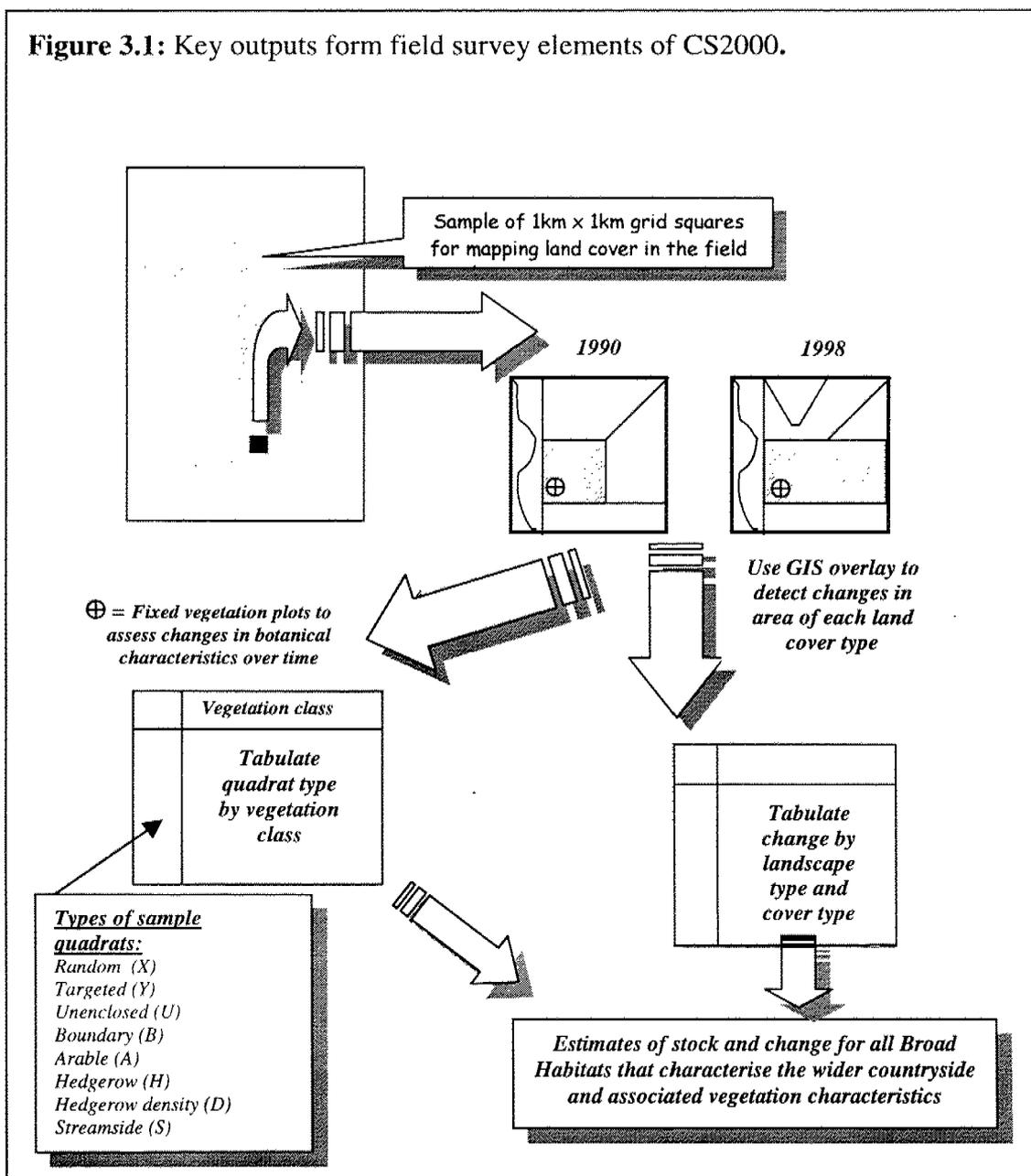
### ***Countryside Survey 2000: Review of Information Outputs***

- 3.4 The importance of CS2000 stems from the fact that it has been designed to give a picture of conditions in the wider countryside (Haines-Young and Swanwick, in press). The general aims of the survey are:
- i. To record the stock of landscape features associated with the wider countryside, including information on land cover, landscape features, terrestrial and freshwater habitats and species, in 1998;
  - ii. To determine change by comparison with earlier surveys (1990, 1984 and 1978);
  - iii. To maintain and refine the base-line set down in 1990 to ensure that the survey data continue to be relevant to current policy needs; and,
  - iv. To develop the data base of countryside information established following the 1990 Survey so that it a range of data outputs, relevant to reporting frameworks used by Central Government and its Agencies, can be derived.
- 3.5 Countryside Survey 2000 has been set up as a co-ordinated programme of work to provide a range of information on the wider countryside from late

2000 onwards. A modular structure has been adopted for the Programme (Appendix A) to accommodate different funding arrangements and the needs of different sponsors. In the context this Scoping Study the most important elements are:

- Module 1: a field-based, sample survey of land cover, land use, linear features and habitats, which includes a survey of plant species occurring in fixed quadrates within the surveyed land cover parcels.
- Module 2: a sample survey of freshwater biota.
- Module 3: a survey of BAP agricultural key habitats;
- Module 4: a survey of upland areas in England and Wales; and
- Module 7: a census of land cover and habitats using remotely sensed data

**Figure 3.1:** Key outputs form field survey elements of CS2000.



Rather than describe each module in detail, for present purposes it is appropriate to review outputs in relation to the need to report at the level of BAP Broad Habitats. The outputs from the field survey and the analysis of remotely sensed data will be considered separately.

### *CS2000: Field Survey*

- 3.6 The main field component of the CS2000 involves a survey of the land cover (habitat) and associated botanical characteristics of a stratified random sample of 570 1km x 1km squares drawn from the GB National Grid<sup>3</sup>. The work builds on the results of previous field surveys made by ITE in 1990, 1984 and 1978.
- 3.7 The earlier reporting frameworks for land cover have, however, been adapted and developed, to provide survey information for the BAP Broad Habitats that characterise the wider countryside (Table 3.1, categories 1 - 19). Indeed, the definitions of the Broad Habitats themselves have been refined partly in response to consultation during the CS2000 Scoping Exercise<sup>4</sup>. **As a result it will be possible to report on:**
- **The area (stock) of each Broad Habitat.**
  - **Change in area for each broad Habitat since 1990 and 1984.**
  - **Condition in 1998, as derived from the analysis of their associated vegetation characteristics.**
  - **Change in the condition of associated vegetation since 1990 and 1978 (Note no vegetation data were recorded in 1984).**

An overview of the outputs from the field survey component of CS2000 is shown in Figure 3.1.

- 3.8 In addition to modification of the CS1990 reporting framework, the number of sample squares used for the survey has also been increased, to improve the statistical precision of cover estimates and to allow independent estimates to be made for individual country units. **As a result, for those Broad Habitats that do not show restricted geographical distributions, it should be possible to make stock and change estimates for England as a whole, to within 25% of the mean.**
- 3.9 Our review of the outputs from CS2000 suggests that, in general terms **it will not be possible to use these data to report at the level of the BAP Priority Habitats, except in the case of cereal field margins.** These are the target of a

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<sup>3</sup> Module 4 is essentially an extension of Module 1, designed specifically to increase sample size in the uplands of England and Wales. The separation of Modules 1 and 4 mainly reflects differences in funding arrangements - both employ the same survey techniques, although all Module 4 squares were surveyed for the first time in 1998.

<sup>4</sup> The position of *Molinia* dominated grassland is, however, yet to be resolved. Following initial consultations it was mapped in CS2000 as part of the acid grassland Broad Habitat. It has now been argued that it is more appropriate to treat this grassland type with Bog.

Table 3.1 CS2000 field survey, Broad Habitats and the wider countryside.

	BAP Broad Habitats <sup>1</sup>	Survey Method <sup>2</sup>
<i>The wider countryside:</i>		
1	Broad-leaved, mixed and yew woodland	M
2	Coniferous woodland	M
3	Boundaries and linear features	M
4	Arable and horticulture	M
5	Improved grass	M
6	Neutral grass	P
7	Calcareous grass	P
8	Acid grass	P
9	Bracken	P
10	Dwarf shrub heath	P
11	Fen, marsh and swamp	P
12	Bogs	P
13	Standing open water and canals	M
14	Rivers and streams	M <sup>3</sup>
15	Montane	P
16	Inland rock	P
17	Built-up areas and gardens	M(ro)
18	Supra-littoral rock	P
19	Supra-littoral sediment	P
<i>Coastal and marine:</i>		
20	<i>Littoral Rock</i>	
21	<i>Littoral sediment</i>	
22	<i>Inshore rock</i>	
23	<i>Inshore sediment</i>	
24	<i>Offshore shelf rock</i>	
25	<i>Offshore shelf sediment</i>	
26	<i>Continental shelf slope</i>	
27	<i>Oceanic seas</i>	

## Notes:

1. Broad Habitats as understood by English Nature 9/6/98.
2. CS2000 Field Survey categories were defined as either 'mappable' (M) or 'plottable' (P) if they occurred on enclosed or unenclosed land respectively, see text for details. M(ro) denotes category surveyed in rural areas only.
3. Field survey data for streamside vegetation (CS2000 Module 1) supplemented with data from freshwater survey (CS2000 Module 2).

specific module within the CS2000 work programme (Module 3), sponsored by MAFF.

- 3.10 In comparison to earlier surveys a different mapping technique was used in CS2000 depending on the type of landscape being considered. Habitat units were classified as either 'mappable' or 'plottable', the former being those that are mainly unenclosed habitats while the latter are those that are enclosed.

- 3.11 In the run-up to CS2000, field trials showed that detailed mapping in unenclosed areas was unreliable. Where boundaries are indistinct, field mapping was found to have a low level of repeatability. **Thus for the plottable Broad Habitats, only the extent of the habitat unit has been recorded, together with any changes *between* Broad Habitat types since 1990.** Detailed information on the spatial differences in structure of the habitats and changes *within* them will be provided from the survey of fixed vegetation quadrats. The information will come from the resurvey of plots previously recorded in 1978 and 1990, and up to 10 new plots ('U plots') located within the sample square to give a more detailed picture of conditions in unenclosed areas.
- 3.12 **By contrast, for the Broad Habitats of enclosed landscapes, the extent of the Broad Habitat will be mapped, together with the individual land cover parcels that make it up. The mapping will be at essentially the same level of detail as in the 1990 survey. Fixed vegetation plots are also located within the mappable Broad Habitats to maintain the data series established in 1978 and 1990.**
- 3.13 **Table 3.2** sets out the relationship between the Broad Habitats mapped by the field survey and the more detailed 'main cover types' used to report CS1990. For the Broad Habitats of the enclosed landscapes ('Mappable' Broad Habitats), it will be possible to map habitat patterns within them using the reporting codes shown on the right of the Table. For the unenclosed ('Plottable') Broad Habitats only the extent of the Broad Habitat will be available, although aggregated information on the spatial variability within the category will be available from the population of vegetation plots that occur within all parcels of that type.
- 3.14 The bulk of the field survey information on Broad Habitats will come from Modules 1 & 4. However, for the Rivers and Streams Broad Habitat, these data will have to be used in conjunction with information from Module 2, which aims to describe the status and distribution and change of the macro-invertebrate fauna of streams in GB. The module involves a resurvey of sites visited in 1990, along with additional work to determine the habitat structure and degree of modification of river corridors, and a limited diagnostic survey of the watercourses to help interpret the results of the macro-invertebrate survey.
- 3.15 A key objective of Module 2 is to investigate the relationships between the habitat quality and modification river corridors, and the ecological quality of the watercourse and the condition of the surrounding countryside. In addition, it is intended that the module should derive indicators relating to the status and change in watercourse and river habitat quality.

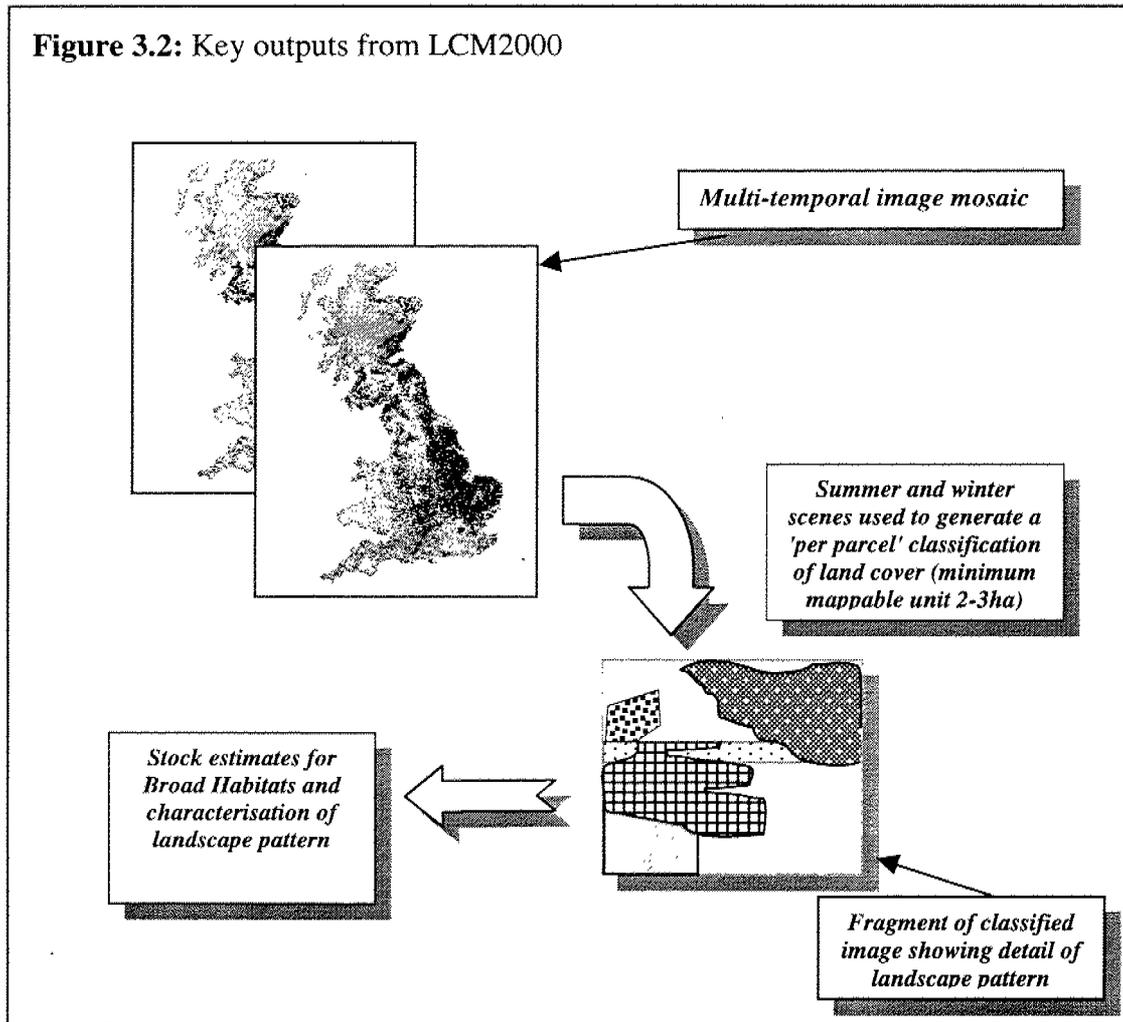
**Table 3.2: Correspondence between the Broad Habitats that characterise the wider countryside and CS1990 reporting codes**

Broad habitats		CS1990 Reporting Code
<b><u>Mappable areas</u></b>		
1. Broadleaved, mixed and yew woodland	38	Mixed woodland
	39	Broadleaved deciduous
2. Coniferous woodland	40	Shrub
	41a	Felled (subdivide by species)
	37	Conifers
	41b	Felled (subdivide by species)
4. Arable and horticulture	1	Wheat
	2	Barley
	3	Oats
	4	Other cereal
	5	Maize
	8	Oilseed rape
	6	Turnips/Swedes
	7	Kale
	9	Other crucifers
	10	Peas
	11	Field beans
	12	Other legumes
	13	Sugar beet
	14	Potatoes
	15	Other roots
	16	Other field crops
	19	Perennial crops
5. Improved grass	18	Non-cropped arable
	20	Recreational grass
	21	Sown grass
	22	Rye grass
	23	Managed grass
	24	Weedy grass
	25a	Non-agriculturally improved grass
	25b	<i>Herb rich grassland (new code)</i>
6. Neutral grassland	31	Unmanaged all grass and tall herb
7. Calcareous grass	26	Calcareous grass
13. Standing open water and canals	43	Still water
17. Built-up areas and gardens	53	Agricultural buildings
	54	Residential buildings
	55	Continuous built
	56	Waste and derelict
	57	Hard areas
<b><u>Plottable areas</u></b>		
8. Acid grassland	27	Upland grass
	29	<i>Molinia</i> moor
	30	Moor (not <i>Molinia</i> )
9. Bracken	28	Bracken
10. Dwarf shrub heath	32	Dense heath
	33	Open heath
	34	Berry-bush heath
11. Fen, marsh and swamp	45	Wetland
12. Bog	35	Drier northern bogs
	36	Wet heaths and saturated bogs
15. Montane Habitats	60	Montane (new code)
16. Inland rock	42	Inland rocks
	58	Quarries
18. Supra-littoral rock	49	Hard coast, no vegetation
19. Supra-littoral sediment	50	Maritime vegetation
	47	Saltmarsh
	48	Dune
<b><u>Mappable lengths</u></b>		
3. Boundary and linear features	51	Railway
	52	Road (includes hedgerows)
14. Rivers and streams	44	Running water

**CS2000: Census of land Cover**

- 3.16 In contrast to the sample-based field survey of Broad Habitats, Module 7 will provide a complete census of land cover in UK using information derived from remotely sensed satellite data. The product will be known as Land Cover Map 2000 (LCM2000). **Figure 3.2** provides an overview of main outputs.
- 3.17 Experience gained during CS1990 suggested that one of the major benefits of the field survey programme is the level of thematic detail that it can provide, compared to that available from the analysis of satellite imagery. A weakness of the field survey methodology, however, is that these detailed thematic data are only available at relative coarse geographical scales. The structure of the field survey programme means, for example, that the spatial variation in land cover and its associated properties can only be described in terms of the 32 ITE Land Classes, which are very broad geographical units. **A census of land cover, made by the analysis of remotely sensed imagery, does not suffer the same limitations of spatial resolution.**
- 3.18 The new techniques adopted for the construction of LCM2000 will provide a 'per-parcel' classification of land cover for the whole of the UK, underpinned by a raster-based classification at 25m resolution (Fuller 1998). The data will be available in several reporting frameworks, each at about the same level of thematic resolution as the earlier census. It has been suggested that by developing techniques to combine the higher thematic resolution of field survey with the higher spatial resolution achieved from the analysis of remotely sensed data, the overall value of survey information will be increased (Wyatt et al. 1998). Classification accuracies of about 90% are anticipated. Using GIS techniques, it should be possible to use LCM2000 to define the broad geographical extent of a general habitat class. Information from the field survey can then be 'nested' within that class to give a picture of the more detailed geographical patterns of habitat structure or change.
- 3.19 **Table 3.3** sets out the relationship between the BAP Broad Habitats and reporting classes supported by LCM2000. The relationship between the BAP Broad Habitats and the mapping units proposed for LCM2000 is more complex than for the Field Survey (Table 3.1). It is proposed that at the most general level, the results of LCM2000 will be available for a series of 'widespread habitats', roughly equivalent to the BAP Broad Habitats.
- 3.20 For some Broad Habitats, namely broadleaf woodland, coniferous woodland, arable and horticulture, improved grass, fen marsh and swamp, montane, inland rock, and built-up areas, there will be a direct read-across (i.e. a '1-to-1' relationship) between the BAP unit and a LCM2000 cover class. For these Broad Habitats it will be possible to use LCM2000 to both define their geographical extent and derive additional information such as the size,

Figure 3.2: Key outputs from LCM2000



frequency distribution of habitat parcels, their degree of isolation or fragmentation and their relationship to other habitat types. For other BAP Broad Habitats, however, their relationship between LCM2000 classes will be more complex and such analysis will be less straightforward.

3.21 Table 3.2 suggests that some Broad Habitats will be spread across more than one LCM2000 class, or that a single LCM2000 class will map the extent of several Broad Habitats. Broad Habitats affected in this way are neutral grassland, calcareous grassland, acid grass, dwarf shrub and heath, bogs, standing water and canals, rivers and streams, supra-littoral rock, and supra-littoral sediment. In order to map the extent of these Broad Habitats data processing will be more complex, involving one or both of the following:

- i. **Aggregation of a series of more detailed, LCM2000 image classes to form the target broad habitats.** For example, the location of the Bog Broad Habitat might be modelled by amalgamating the 'wet' variant of grass moor (Table 3.2, LCM2000 Category 6), the 'wet' variants of the open and closed heath sub-classes (i.e. subclasses of LCM2000 category 7), and blanket bog (category 8).

Table 3.3 BAP Broad Habitat and Representation in CS2000

	BAP Broad Habitats <sup>1</sup>	LCM2000 <sup>2</sup>
<i>The wider countryside:</i>		
1	<b>Broad-leaved, mixed and yew woodland</b>	<b>10</b>
2	<b>Coniferous woodland</b>	<b>11</b>
3	Boundaries and linear features	N/a
4	<b>Arable and horticulture</b>	<b>15</b>
5	<b>Improved grass</b>	<b>12</b>
6	<i>Neutral grass</i>	<i>13</i>
7	<i>Calcareous grass</i>	<i>13</i>
8	<i>Acid grass</i>	<i>6, 13</i>
9	<i>Bracken</i>	<i>13</i>
10	<b>Dwarf shrub heath</b>	<b>7</b>
11	<b>Fen, marsh and swamp</b>	<b>14</b>
12	<i>Bogs</i>	<i>6,7,8</i>
13	<i>Standing open water and canals</i>	<i>2</i>
14	<i>Rivers and streams</i>	<i>2</i>
15	<b>Montane</b>	<b>9</b>
16	<b>Inland rock</b>	<b>18</b>
17	<i>Built-up areas and gardens</i>	<i>16,17</i>
18	<i>Supra-littoral rock</i>	<i>3</i>
19	<i>Supra-littoral sediment</i>	<i>3</i>
<i>Coastal and marine:</i>		
20	<i>Littoral Rock</i>	<i>3</i>
21	<i>Littoral sediment</i>	<i>3</i>
22	<i>Inshore rock</i>	
23	<i>Inshore sediment</i>	
24	<i>Offshore shelf rock</i>	
25	<i>Offshore shelf sediment</i>	
26	<i>Continental shelf slope</i>	
27	<i>Oceanic seas</i>	

## Notes:

1. Broad Habitats as understood by English Nature 9/6/98
2. LCM2000 Target Class numbers given, as provided to CS2000 JMT 18/11/98. Class names are as follows: 2= inland water; 3= beach and coastal bare; 6= grass moor; 7= shrub heath; 8= blanket bog; 9=montane; 10=deciduous broadleaf; 11=coniferous; 12= agricultural managed grass; 13= unimproved grass; 14= fen marsh and swamp; 15= tilled/arable; 16= suburban/rural developed; 17= continuous urban; 18= inland bare ground. Proposed LCM2000 target classes 1 (sea/estuary), 4 (saltmarsh) and 5 (dune) have no equivalent Broad Habitat category. Where class numbers are in italic, there is no direct read-across between LCM2000 reporting category and BAP Broad Habitat.

- ii. **Differentiation of a LCM2000 Target Class using other geographical or contextual data.** For example, the calcareous grassland Broad Habitat (Table 3.2, category 7) can be split out of the general unimproved grassland category mapped by LCM2000 (category 13) by means of a geological mask.
- 3.22 The Broad Habitat data available from LCM2000 will be mappable at the resolution of the parcels defined in the image classification process. If the resolution of the underlying imagery is 25m, then it is likely that the minimum mappable habitat unit will be of the order of 2500m<sup>2</sup>. Such high-resolution data will mainly be used at the local level. At regional and national scales, it is likely that aggregated data for the stock of each Broad Habitat per km<sup>2</sup> will be available via such systems as the Countryside Information System (CIS).

### ***Understanding Geographical Patterns***

- 3.23 The analysis of CS1990 data both in the *Main Report* (Barr et al. 1993) and in the pilot environmental accounts study (Haines-Young et al. 1996) showed that it was possible to produce regional views of Countryside Survey data. Such geographical disaggregation is relatively simple, given the availability of GIS such as the Countryside Information System (CIS).
- 3.24 The main constraint on producing geographical breakdowns of Countryside Survey data is that, as the size of spatial reporting unit reduces, the statistical precision of area and change estimates from the field survey component of CS2000 declines. This restriction would not apply to information from LCM2000, whose accuracy is dependent on classification accuracy and not geographical scale.
- 3.25 The issue of appropriate geographical scale for the construction of nature conservation accounts has been considered in Part 2 of this document. In relation to the general requirements outlined earlier, our investigations suggest that for reporting CS2000 field survey results a range of geographical disaggregations are available including:
- i. **A set of general landscape types** similar to those used to report for CS1990 (**Figure 3.3**), but modified to take account of the more restricted range of conditions occurring in England compared to the whole of GB. It has been argued that four general regions might be appropriate for England. A final decision about reporting units has yet to be taken, but one suggestion for a suitable geographical breakdown is: marginal upland and upland landscapes, intensive arable, arable, and pastoral landscapes.
  - ii. **Geographical regions formed by aggregating Natural Areas or Joint Character areas.** Using GIS techniques it is possible to aggregate these basic units using criteria such as the dominant ITE Land Class, or some other criteria relevant in a particular policy context, such as the 6-fold typology of Natural Areas already devised EN.

**Figure 3.3:** The Four Major Landscape Types of Great Britain used for the Geographical Disaggregation of the Environmental Accounts (after Barr et al. 1993).



- iii. **Thematic or administrative regions** including those that might relate more closely to the possible drivers of countryside change as derived from data such as the Farm Business Survey, June Census, or DETR and EN Regions.

### ***General Suitability of CS2000 Data for Environmental Accounts and role of Other Data***

3.26 The complex relationship between the reporting classes defined by the field survey and the LCM2000, means that it is not yet clear how final estimates for the 1998 stock BAP Broad Habitats will be produced from CS2000. The two components of the survey will have to be calibrated against each other in order for a single set of estimates to be made, and for the detail of the field survey to be mapped using LCM2000. However, although these processing issues have

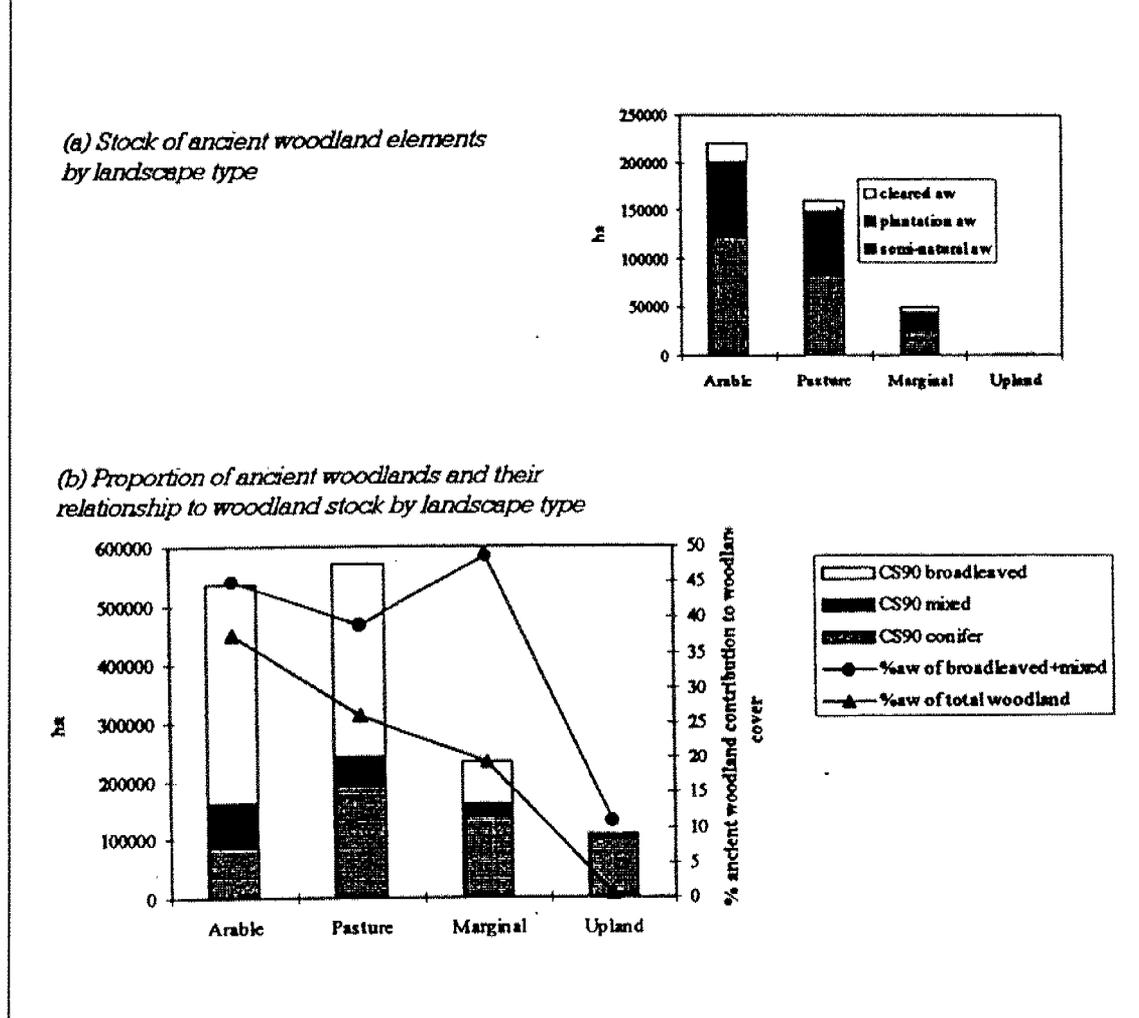
yet to be resolved, this review of CS2000 data suggests that for this Scoping Study, the following conclusions can be drawn:

- i. It will be possible to obtain estimates for the stock and change of the **all** BAP Broad Habitats that characterise the wider countryside from the field survey component of CS2000.
- ii. The main constraint on the use of the Broad Habitat data from field survey, will be its statistical precision. Although the number of sample squares used in for CS2000 has been increased, with the aim of reducing the standard error of stock estimates for Broad Habitats to less than 25% at the GB scale. However, for some localised habitats (e.g. calcareous grassland) this level of precision may not be achievable.
- iii. For each Broad Habitat it will be possible to gain information about their mosaic structure either from more detailed mapping in the enclosed landscapes, and/or vegetation data recorded from the fixed sample plots. It will not, however, be possible to report at the level of BAP Key Habitat, except for cereal field margins.
- iv. For each Broad Habitat it will be possible to describe their associated botanical characteristics, so that comparisons in vegetation structure can be made in terms of patterns within and between habitats types at national and regional scales.
- v. For some BAP Broad Habitats it will be possible to map their geographical extent using LCM2000, although for some it may be necessary to refine the mapping using other criteria such as altitude or geology. At the local scale it will be possible to map habitat patches using a minimum-mapping unit of about 50m x 50m (2500m<sup>2</sup>). At national scales it will be possible to map the area of each Broad Habitat per km<sup>2</sup> using systems such as the CIS.

### ***Other Data Sources***

- 3.27 In this part of our Report we have focused exclusively on CS2000 as a potential source of information about the wider countryside. This data set is clearly important but it is not the only source that could be used to develop environmental accounts for nature conservation. Thus we have considered what additional data are potentially available. Rather than provide a comprehensive review, however, we have focused on those sources that would complement or extend the type of information available from CS2000.
- 3.28 If CS2000 data are taken as the starting point for the development of a set of environmental accounts, one could envisage other potential data sets as having one of two roles. On the one hand they could be used to ***add detail*** to the picture provided by CS2000. On the other, they could ***broaden our view*** of the wider countryside.

**Figure 3.4: Relationship between stock of ancient woodland and total woodland for England and Wales (after Haines-Young et al. 1996)**



*Adding Detail*

3.29 A limitation of CS2000 is that it will describe the condition of the wider countryside in a fairly general way. Although the condition of Broad Habitats are a concern of the *Biodiversity Action Plan*, the focus attention in the 'BAP Process' is mainly at the level of the Key Species, and Key or Priority Habitats. As we have seen, CS2000 is not able to provide little information below the Broad Habitat level. To develop a comprehensive set of environmental accounts we clearly have to link CS2000 data with other information to achieve the level of detail that is required.

3.30 **Figure 3.4** illustrates what types of analysis might be attempted. These data show the stock of broad-leaved woodland, by major landscape type, and the proportion of the woodland stock classified as ancient woodland. In this example, stock estimates for broad-leaved woodland are derived from CS1990 and the information on ancient woodland area comes from EN's *Ancient*

*Woodland Inventory.* The ancient woodland blocks were assigned to each landscape type by mapping their centroids using CIS (see Haines-Young et al. 1996).

- 3.31 The ancient woodland inventory is typical of a number of habitat inventories available to EN, that would enable them to 'split out' particular habitat types from a general Broad Habitat category for special attention. Clearly issues of temporal consistency and definitions across reporting frameworks would have to be considered (see Wyatt et al., 1990). However, with the increasing availability of data in digital format, such analysis will be possible using GIS. Other national inventories that could be linked to CS2000 include the census of woodlands currently being completed by the Forestry Commission.
- 3.32 In addition to inventory data, detail could also be added to the Broad Habitat categories by estimating the area of each reporting unit that is protected, designated, or included in some agri-environmental scheme.

#### *Broadening the 'CS2000 View'*

- 3.33 A second limitation of CS2000 is that it is focussed on habitats and their associated botanical characteristics. In order to develop a set of environmental accounts that would give a complete picture of the condition of the wider countryside it necessary to broaden the range of data used to include other elements, notably important animal groups.
- 3.34 A number of national animal atlas or databases are now available, including the information from the British Breeding Bird Survey, and the Biological Records Centre (BRC). If proposals for a 'national mammal monitoring network' are implemented then in the future much additional information will be available (Macdonald et al. 1998). We have considered what role such data could initially play in a set of environmental accounts or nature conservation and conclude:
- i. Since such data are available at a variety of spatial and temporal scales it is unlikely that they could be linked closely to the Broad Habitat categories used in CS2000.
  - ii. Integration will most easily achieved at the 'landscape level', by using GIS techniques to provide regional views of these animal data.
- 3.35 **As a result we suggest that the initial role of these data in a set of environmental accounts would be to serve as additional indicators of the state of the wider countryside at national and regional scales.** Trends in particular species' populations or species groups could also be used to gauge the impact, or check the significance of, changes in habitat or landscape structure.

- 3.36 Given the complexity of ecological processes, it is unlikely that any set of environmental accounts could establish a *causal connection* between habitat and landscape change and general trends in populations of species groups in the wider landscape. Rather, the value of the accounting exercise is in bringing data on various key aspects of the countryside together, to inform our judgements about the significance of environmental change. The accounting framework cannot resolve all scientific uncertainties, but it can help us set of the issues in a systematic way and therefore support the policy process.
- 3.37 Our consultations suggested that while CS2000 data is by no means comprehensive, it appears to provide a framework for the development of a flexible system of environmental accounts that could be extended and refined by linking these data to other sources of information. Before final conclusions about the suitability of these data can be drawn, however, a number of methodological issues must be resolved. The most important question that we need to consider is how the survey data could be used to assess 'condition' at the Broad Habitat and landscape levels. These methodological issues are considered in Part 4 of this Report.