Part 5: The Relationship Between EN Initiatives and the CS2000 Work Programme

Background

5.1 Our work suggests that the development environmental accounts for nature conservation using CS2000 information would be helpful to English Nature because it would assist them in their evaluation of the outputs of the most recent countryside survey. However, in using these data to characterise the condition of the wider countryside there is potential overlap between any EN initiative in this area and other work that might form part of the CS2000 work programme itself. **The danger of overlap is particularly acute because DETR's specification for CS2000 contains the requirement that ITE should report field survey results for Broad Habitats in an environmental accounts framework.**

5.2 As part of our Study we have therefore considered EN's general requirements for environmental accounts, the approach that might be adopted for their construction, and how these requirements relate to proposals for the way in which CS2000 is to be reported. **Our investigations suggest that although there is potential overlap between various initiatives, there is an opportunity for strategic work to be undertaken by EN that would complement and extend that of the main CS2000 work programme, and be of long term benefit to EN itself.**

5.3 Although EN is a member of the CS2000 Advisory Board, it has not been involved in the funding of the Survey. Thus there has been limited scope for shaping the deliverables from the project. Present interest in environmental accounts for nature conservation may, however, permit a more active involvement in the issues relevant to the analysis and reporting of CS2000 data.

5.4 In this Report we consider how work undertaken by EN could both add value to the proposed analysis of CS2000 data, and help EN meet its various reporting commitments in relation to the BAP Broad Habitats and the wider countryside.

Environmental Accounts from CS2000 - EN's Role

5.5 Our recommendations for the way in which work within EN might develop starts from the observation that DETR's requirement that CS2000 results should be presented in an accounts framework, relates mainly to the content of the initial summary report, to be delivered by ITE in late 2000. **We note that although there is a requirement that an accounts format is adopted, the structure of these accounts is still open.**

5.6 **We therefore propose that EN should play an active role in discussions that will determine the CS2000 Summary Report.** In particular, EN should:

i. In collaboration with DETR and ITE, undertake work during 1999 that would lead to an agreed methodology by which the condition of BAP Broad Habitats and the wider countryside can be assessed.

ii. Once the results of this Scoping Study are evaluated, EN should commission the preparation of a more detailed set of nature conservation habitats accounts using CS2000 data. Such work should be undertaken in partnership with DETR. It is suggested that:

- The first output from such a study should be summary accounts for Broad Habitats for England, published in the CS2000 Summary Report. Discussion of the accounts in the Summary Report should be confined to a description of the trends in the condition of the Broad Habitats, and the general implications of such trends for the condition of the wider countryside. Any geographical disaggregation should be confined to the type of general landscape type used in the 1990 Report (e.g. Arable lowlands, pastural lowlands, etc.)

- A second and more detailed set of accounts is published in 2001, in which information broken down by Natural Area Groups and presented in a wholly English context. The detailed report should provide a complete assessment of the condition of the wider countryside, and may include data in addition to CS2000, such as that available from BTO. The study should also explore the specification of targets relating to the condition of Broad Habitats and the wider countryside. These targets could be used as the basis for the development of condition indicators and the discussion of future monitoring strategies.

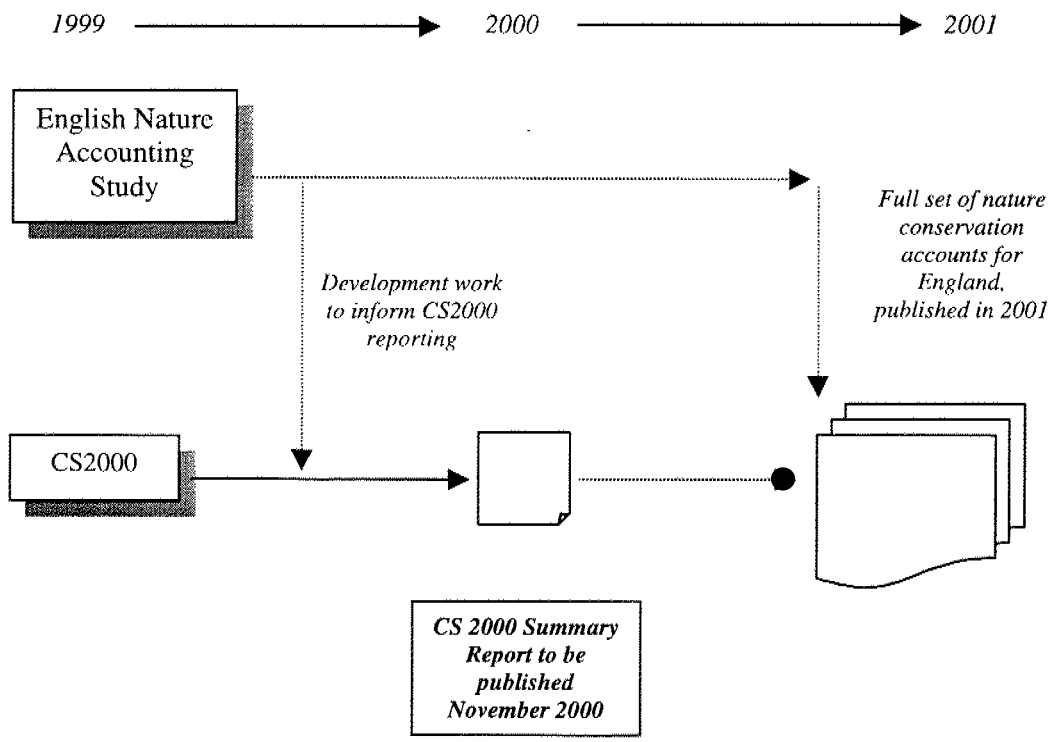
The relationship between the different initiatives and the various outputs is summarised in Figure 5.1.

5.7 We consider that a commitment of resources by EN is justified because:

i. The investment would enable a more effective set of environmental accounts to be developed that would better support the 'BAP Process'. This is important because it is clear that while there is a requirement for CS2000 data for Broad Habitats to published in an accounts format, the resources available for this component of the work is limited, and such outputs will be rudimentary. **As a result the accounts will not enable the conservation status of Broad Habitats and the wider countryside to be fully assessed.**

ii. It would bring EN closer to the centre of the CS2000 reporting process. This is important because DETR envisage that the initial outputs from the survey will include more detailed interpretation of the results than

Figure 5.1: Relationship between work in English Nature and CS2000 initiative.



was possible with CS1990. Involvement in developing the accounting framework would enable ENs to make a significant input into this reporting process.

iii. Early involvement in the interpretation and use of CS2000 would enable EN to assess their value in respect of its other reporting requirements. For example, CS2000 data are likely to be used as an input into the Millennium Report on Biodiversity.

iv. The experience gained in using CS2000 data would enable EN to assess their requirements for other types of data that could be used to extend and refine the accounting process. As noted above, while CS2000 are a major source of information about the countryside, it would be limiting to base any accounting initiative on any single source. Gaps in the 'CS2000 world view' must be identified and resolved by including other information sources in a more comprehensive set of environmental accounts.

5.8 In view of the constraints imposed by the CS2000 reporting process it is important that any development work undertaken by EN is both tightly focused and feasible within the time remaining. In the final part of this Report we therefore set out a specification for this additional work in detail. Before these proposals are presented, however, it is important to set such work in a

wider context. For although the CS2000 initiative is important, ENs requirements must also be considered in relation to other on-going work that aims to develop an integrated approach to economic and environmental accounting.

Part 6: Linking Environmental and Economic Accounts

Background

6.1 The last major issue to be considered by this Study is how nature conservation accounts might be used to understand the impact of economic activity on the countryside. Interest in making such a link stems both from previous work in this area, such as the pilot accounting study undertaken for DETR (Haines-Young et. al 1996), and the recent publication of the *1998 UK Environmental Accounts* by Office of National Statistics (ONS, 1998).

6.2 The *UK Environmental Accounts* are at present confined to atmospheric emissions and water. While the importance of extending these accounts to land was noted in the document, there has been little progress in this area. The benefits and opportunities for developing landscape and biodiversity accounts that could be linked to national economic accounts was therefore considered in our initial round of consultations.

6.3 It has been suggested that link might between economic and environmental accounts might be achieved via an understanding between the relationships between land use and land cover. The problem is, however, complex because in linking economic sectors to their impact on the habitats that make up the wider countryside, one would need to take into account at least three types of relationship:

i. Direct land take, that is the transfer of land between economic sectors (e.g. from agriculture to commercial forestry);

ii. Changes in management pressure within a sector (e.g. intensification of farming regime, changing forestry management); and,

iii. Indirect effects, via changes in the ambient environment (e.g. acid precipitation, eutrophication, fragmentation etc.).

The complexity of the relationships is compounded by the fact that the interactions operate at different spatial and temporal scales.

6.4 **Our review of the range of the type of information that will be available from CS2000 suggests that it is probably inadequate in terms of building a sectoral model that links landscape change to economic activity, via an understanding of the land use x land cover relationship.** However our consultations suggested that there were several alternative avenues that could be explored in future work.

Emissions accounts and critical loads

6.5 It was suggested, for example, that one approach to integrating sectoral and environmental accounts might be to take the recently published emissions and water accounts and link them to habitat and landscape accounts in some way. Given the complexity of the task it is perhaps most easily approached in a stepwise fashion. For example, it would be feasible to link the emissions account for those pollutants responsible for acid deposition, eutrophication and ozone damage to information on Broad Habitats using the concept of **critical loads.**

6.6 A critical load is the level of exposure to a particular pollutant below which significant impacts on sensitive elements of the environment are unlikely. For a given pollutant, the critical load can be mapped and if these spatial patterns are then compared with actual deposition loads then areas of exceedance can be identified. It has been shown by ITE, for example, that in terms of the acidifying effects due to sulphur and nitrogen, exceedances are concentrated in the uplands and marginal uplands of England and Wales.

6.7 **Using this type of analysis, environmental accounts could be developed that estimate the stock of each Broad Habitat that is *potentially* vulnerable to the effects of acidification, eutrophication due to atmospheric deposition and ozone damage, and how this stock might change under different emissions scenarios.** Although promising the major limitation of such an analysis is that the damage caused by deposition is difficult to quantify and measure 'on the ground', because of the other local factors that impact on habitat quality, such management pressure. Such accounts would therefore largely be 'indicative' in character.

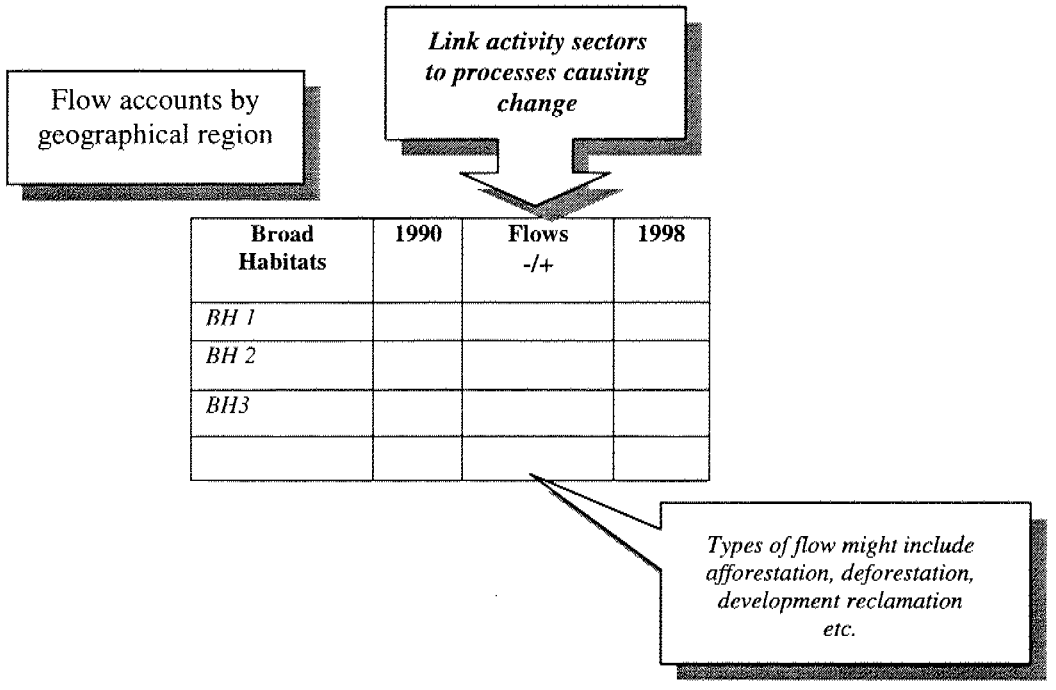
Sectoral analysis

6.8 A second approach to linking economic and environmental accounts that could be considered would be to approach the problem sector by sector. In fact, given that EN have already developed a conceptual model that attempts to describe the relationships between different economic sectors and their impact on the conservation resource, it would be useful to examine this model in detail. Although the link to economic accounts is conventionally made through the land cover x landuse relationship, a complementary approach might also be to make a link though the 'process columns' in the flow account. This approach assumes that economic activity is a principal driver of habitat change and that different sectors transform habitat in different ways (**Figure 6.1**).

Calculating defensive and remedial measures

6.9 Given the complexity of linking economic and environmental accounts it is unlikely that integrated accounts can be developed in the short term. Nevertheless, our consultations suggested that there was support for the idea that the development of nature conservation accounts by EN was a useful first step, not least because they may help us to make estimates of the costs of various 'defensive' and 'remedial' measures.

Figure 6.1: Linking flow accounts to sectoral activity



6.10 The development of costed species and habitat plans is an important element in the 'BAP Process'. The approach could be extended to all Broad Habitats by using the flow, pattern and biodiversity accounts to estimate costs of preventing certain types of change from occurring (defensive expenditures) or encouraging other types of transformation to happen (remedial expenditures). Accounts can therefore be used to help assess the costs of achieving various conservation targets for Broad Habitats and the wider countryside. The approach could be linked to the type of analysis suggested in Figure 6.1, in that the account could be used to estimate the costs of influencing each activity sector.

6.11 Consultations suggested that an advantage of this approach was that it could help 'monetorise' the environmental accounts without having to resort to the evaluation of environmental resource by means of 'willingness to pay techniques'.

Conclusions

6.12 Those consulted argued that the environmental accounts developed by ONS for emissions and water have been very useful for policy development. Thus the goal should be to build a robust set of land or habitat accounts that might do the same for biodiversity. **Given the complexity of the issue, it was argued that such work should take a lower priority compared to the development of environmental accounts for Broad Habitats and the wider countryside using CS2000 data.** As a result much of our effort in this Study

has been on developing a methodology for constructing nature conservation accounts rather than the problem of linking them to accounts describing patterns of economic activity.

6.13 **We recognise that further work needs to be done in this area, and recommend that EN should progress such work in partnership with DETR, in the design of the 'drivers of countryside change' module that is associated with the CS2000 work programme.**

Part 7: Next Steps - Developing an Accounting System for Nature Conservation

Introduction

7.1 Our evaluation of the outputs from CS2000 suggests they provide a foundation for developing a set of environmental accounts. These accounts would help EN to share its view of the conservation species and habitats with the wider policy community. We have argued that before such accounts could be created, however, some additional development work is required so that CS2000 data can be analysed in ways that are relevant to ENs needs. In this final part of our Report we set out some ideas for this additional work, which takes the form of a pilot study and a consultation exercise.

Pilot Study

7.2 The pilot study has been designed to consider each step in the process that would eventually result in the construction of a full set of environmental accounts using CS2000 data. Since the results of CS2000 will not be published until November 2000, the pilot study makes use of existing countryside survey data to develop the tools that would eventually be required. The outputs from the pilot study will enable EN to use the results of CS2000 as soon as they become available.

7.3 An overview of the proposed pilot is shown in **Figure 7.1.** We suggest that there are four steps to building a set of environmental accounts for nature conservation.

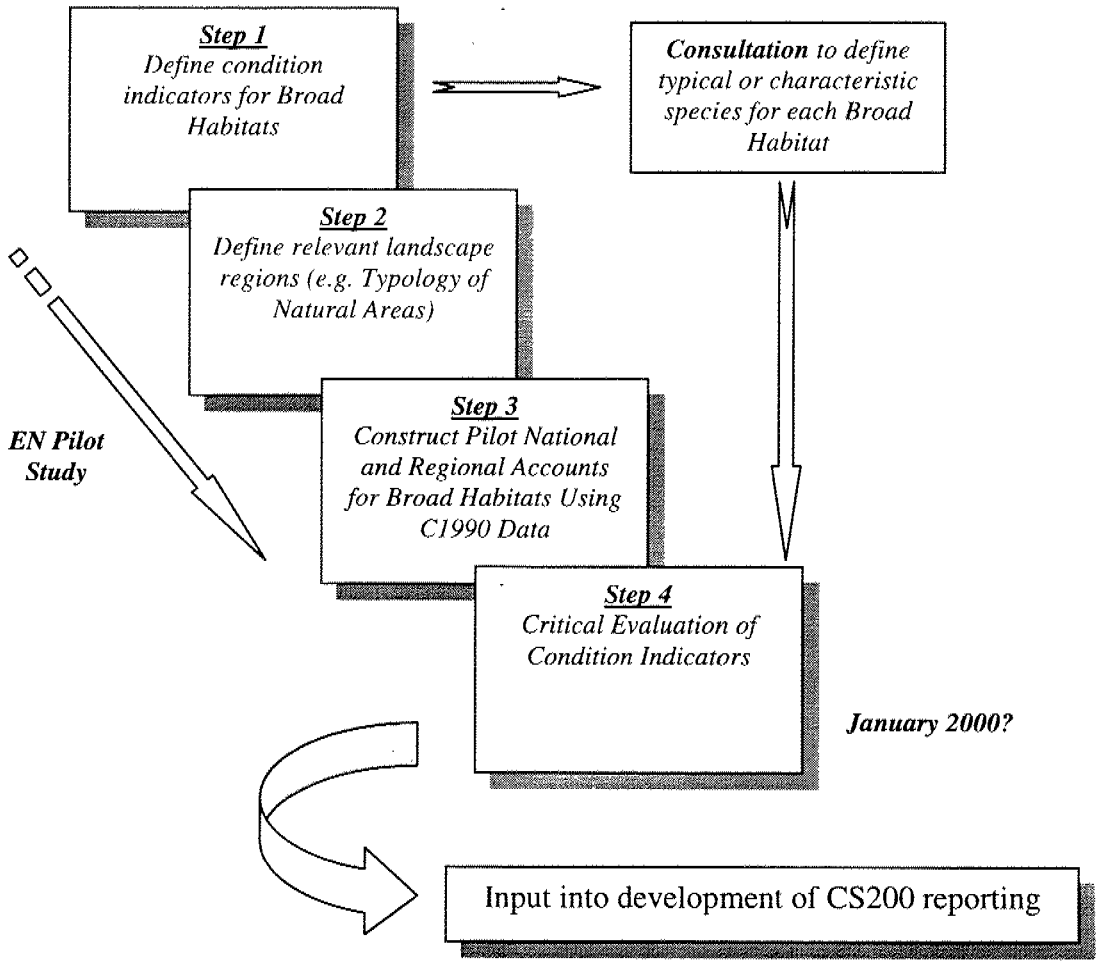
Step 1: Defining Condition Indicators for Broad Habitats

7.4 As a result of our analysis in Part 4 of this Report we conclude that an initial set of accounts should include four types of accounts table, namely:

- Stock accounts
- Flow accounts
- Pattern accounts
- Biodiversity accounts

Although each of these types of account can be constructed using CS2000 data, they could not be used effectively unless they can be linked to the statements set out in the *Biodiversity Action Plan.* Thus the first step in building a set of nature conservation accounts is to refine and extend the information contained in each BAP Habitat Statement so that they reference to some state or trend that could be assessed using the accounts.

Figure 7.1: Structure of proposed Pilot Study



7.5 Table 7.1 shows how the some of the relevant sections of the Habitat Statement for Broad-leaved Woodland (cf. Table 4.1) might be transcribed. Several points can be made about this example:

- Identification of the condition indicators should be driven by the ecology of the Broad Habitat. They should be specific to the issues affecting that habitat so that different combinations of measures will be relevant for each habitat unit.

- Some condition indicators (e.g. ancient woodland stock) may not be measurable using CS2000 data. If alternative data exists that can be nested into the Broad Habitat category, then these should be identified.

7.6 The example shown in Table 7.1 is meant for illustrative purposes only, and is not intended to exhaust the range of possible condition indicators for the this

Table 7.1: Example of Condition Indicators for Evaluation of Broad-leaved Woodland Derived from BAP Habitat Statement

BAP statement: *'Maintain extent and reduce conversion to other use'*

(1) **Condition Indicator from Flow Account:** Gain in woodland area, or no net loss.
(2) **Condition Indicator from Flow Account:** No loss of initial stock, or reducing rate of loss

BAP statement: *'Restrict planting on sites that would adversely affect conservation value'*

(3) **Condition Indicator from Flow Account:** No gain from semi-natural Broad Habitats

BAP statement: *'Encourage natural processes'*

(4) **Condition Indicator from Biodiversity Account:** Mean scores for woodland plots on IBD1, IBD3, IBD5 and IBD6 to approach values typical of best woodland sites

BAP statement: *'Restore selected ancient woodland sites'*

(5) **Condition Indicator from Stock Account:** Not available unless inventory data can be nested into CS2000 category

Broad Habitat. **It is proposed that the first stage of the pilot study would draw upon relevant literature and expert opinion to derive a more complete set of condition indicators for each Broad Habitat. This work would also prioritise those indicators that are considered critical and identify what additional data would be required to give a more complete picture of each Broad Habitat over and above that provided by countryside survey.**

7.7 In the case of the biodiversity accounts, we have suggested that attention should focus on those measures proposed for the analysis of CS2000 data. We suggest, however, that an additional element of the pilot should be to initiate the process of defining lists of 'typical' or 'characteristic' species for each Broad Habitat. The process of drawing up these lists may need to go on in parallel to the pilot (see para 7.17), and, except in the case of the grassland indicators, these indicators of biodiversity may not be used in the analysis envisaged during the Pilot. However, the output from this exercise would form an input to the final phase of the study, namely a critical review of the condition indicators used in the work.

Step 2: Defining Relevant Landscape Units

7.8 We have argued that landscape accounts could be constructed by considering the mosaic of all Broad Habitats in an area. Thus, in order to provide a

geographical framework the second step in the pilot involves agreeing a suitable set of regions for the disaggregation of the accounts data.

7.9 Access to systems such as the CIS mean that the construction of alternative regional views of Countryside Survey data can be constructed rapidly. **We suggest that for the purposes of the pilot study a typology of Natural Areas should be used, such as that already devised by EN.**

7.10 Although the condition of the landscapes in these broad geographical regions will mainly be assessed by reference to the Broad Habitats that occur within them, a useful input at this stage in the pilot would be to identify any particular regional issues. These issues can then be used to identify additional condition indicators at the level of Broad Habitats, which could be applied to the Broad Habitat data for a specific region, or they might be used once the information for the landscape region as a whole are assembled.

Step 3: Construct National and Regional Accounts Using CS1990 Data

7.11 Previous work has shown that CS1990 data can be used to construct land cover accounts. In the light of more recent work it is feasible to recast these data in terms of Broad Habitats and the set of geographical units defined above. We propose this as the third stage in the pilot study.

7.12 An example of the form the accounts might take for each Broad Habitat is shown in Figure 4.1 (page 40). Stock, flow, and biodiversity accounts would be constructed for each Broad Habitat. Pattern accounts could not be constructed given the limitations of the Land Cover Map 1990 data format. The accounts would show change area change since 1984 and biodiversity change since 1978. Using these data in conjunction with the condition indicators developed in Stage 1 of the Pilot, an assessment of the status of each habitat unit both regionally and nationally can be attempted.

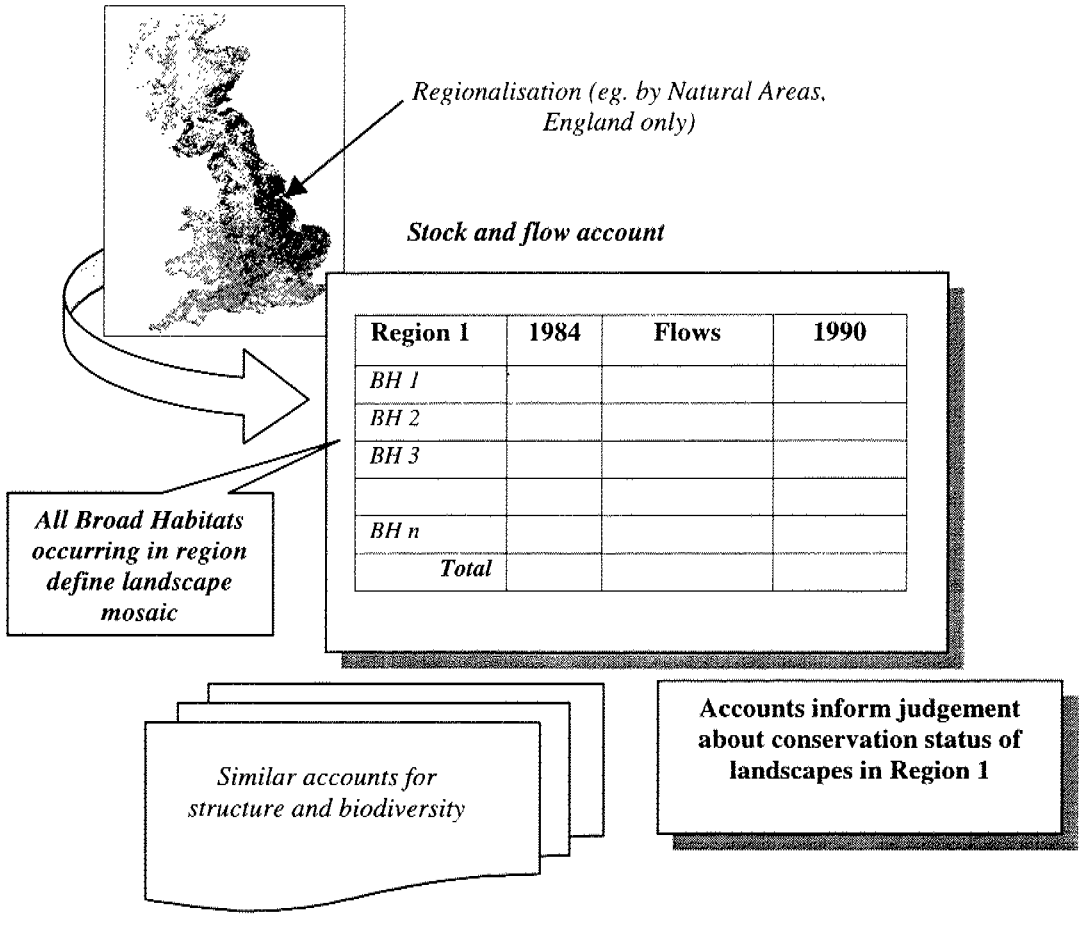
7.13 The data on Broad Habitats can then be reorganised to give an overview for all habitat units in each of the regions defined by Step 2, and the results presented as a set of equivalent 'landscape accounts' (**Figure 7.2**).

Step 4: Critical Evaluation of Condition Indicators

7.14 The final element in the Pilot Study should be:

- A critical review of the condition indicators identified in Stage 1.
- An assessment of the value of adding measures based on typical or characteristic species to the suite of Indicators of Botanical Diversity used in the biodiversity accounts.
- An assessment of the value of producing regional disaggregations of the accounts data both to English Nature and the other country agencies. In particular, the assessment should explore the extent to which regional views of landscapes could be used to indicate the groups of Natural Area vulnerable to particular types of change. The regional disaggregation could

Figure 7.2: Example of how broad habitat data would be disaggregated regionally to produce landscape accounts



also be explored in terms of whether change at these scales could be attributed to particular economic activity sectors.

Consultation Exercise

7.15 We recognise that the process of defining condition or quality indicators for the Broad Habitats may need a formal mandate from the Biodiversity Coordinating Group. Thus EN may need to create a process that can engage relevant interest groups in order to develop the concepts. Although this consultation process will go on outside the Pilot (Figure 7.1) the latter could be used to illustrate and test ideas, so that more rapid progress can be made.

7.16 One task of the consultation exercise would be to draw up lists of species that are characteristic or typical of each Broad Habitat. The need for such species lists is recognised in the *Biodiversity: UK Steering Group Report* (HMSO, 1995, para 2.15, p.22).

Timetable for Consultation and Pilot Study

7.17 We suggest that the pilot study should be undertaken in 1999 and be completed by January 2000. This timetable would allow sufficient time for the outputs to assist in the preparation of the CS2000 Summary Report. It would also be valuable if the consultation exercise could be completed over a similar timetable so that the conclusions could also inform the analysis of CS2000 data.

7.18 As noted in Part 5, following the publication of the CS2000 Summary Report, the development work proposed here will also enable a full set of environmental accounts for nature conservation to be published. It is anticipated that these accounts would differ from those of the pilot study and the CS2000 Summary report by:

- Inclusion of a wider range of condition indicators.
- Inclusion of a wider range of data sources in the accounts, to add detail to the Broad Habitat reporting framework and extend the range of condition criteria used to assess the conservation status of the wider countryside.
- Present and analyse the accounts in terms of Natural Areas or Joint Characters Areas rather than the broad landscape types envisaged for reporting CS2000.

7.19 We suggest that publication of the detailed set of environmental accounts should occur early 2001. This timetable would support EN in developing a range of environmental indicators for the countryside at national and regional scales. Early publication of these accounts in 2001 would be assisted by the development work carried out during the pilot study in period up to release of the CS2000 Summary Report.

Conclusion

7.20 The development work proposed is of strategic importance, because it will allow English Nature to evaluate the accounting concept and to participate actively in the CS20000 reporting process. In the long term we consider that such work will also help English Nature to develop of ways of describing and reporting the conservation status of habitats, landscapes and the wider countryside.

7.21 As noted at the outset, environmental accounts are primarily a tool for integrating data about the environment in policy relevant ways. They enable us to document the condition of resources systematically and to understand the processes that are transforming them. Accounts can be valuable in helping to define and monitor management targets, and to develop and review policy goals. In this report we have shown that the availability of Countryside Survey data will facilitate the development of an accounting model that meets some of ENs reporting requirements in relation to the wider countryside. **We therefore recommend that the environmental accounting concept be further explored as part of English Nature's on-going work programme.**

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Appendix A: List of modules in CS2000 work programme (as of December 1997)

Module	Name
1.	Survey of broad habitats and landscape features
2.	Survey of freshwater habitats
3.	Survey of BAP agricultural key habitats
4.	Survey of Uplands in England and Wales
5.	Survey of breeding birds
6.	Survey and analysis of soils
7.	Land Cover Map 2000
8.	Airborne scanner applications
9.	Integration of sample and census data
10.	Links to Environmental Change Network
11.	Links to Northern Ireland Countryside Survey
12.	Links to monitoring agri-environment schemes
13.	Access to data and scientific support
14.	Drivers of countryside change
15.	Ecological processes of change
16.	Programme co-ordination and liaison