



## **SID 5** Research Project Final Report

- **Note**

In line with the Freedom of Information Act 2000, Defra aims to place the results of its completed research projects in the public domain wherever possible. The SID 5 (Research Project Final Report) is designed to capture the information on the results and outputs of Defra-funded research in a format that is easily publishable through the Defra website. A SID 5 must be completed for all projects.

- This form is in Word format and the boxes may be expanded or reduced, as appropriate.

- **ACCESS TO INFORMATION**

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### **Project identification**

1. Defra Project code
2. Project title
3. Contractor organisation(s)
4. Total Defra project costs (agreed fixed price)
5. Project: start date .....   
end date .....

6. It is Defra's intention to publish this form.  
Please confirm your agreement to do so..... YES x

(a) When preparing SID 5s contractors should bear in mind that Defra intends that they be made public. They should be written in a clear and concise manner and represent a full account of the research project which someone not closely associated with the project can follow.

Defra recognises that in a small minority of cases there may be information, such as intellectual property or commercially confidential data, used in or generated by the research project, which should not be disclosed. In these cases, such information should be detailed in a separate annex (not to be published) so that the SID 5 can be placed in the public domain. Where it is impossible to complete the Final Report without including references to any sensitive or confidential data, the information should be included and section (b) completed. NB: only in exceptional circumstances will Defra expect contractors to give a "No" answer.

In all cases, reasons for withholding information must be fully in line with exemptions under the Environmental Information Regulations or the Freedom of Information Act 2000.

(b) If you have answered NO, please explain why the Final report should not be released into public domain

## Executive Summary

7. The executive summary must not exceed 2 sides in total of A4 and should be understandable to the intelligent non-scientist. It should cover the main objectives, methods and findings of the research, together with any other significant events and options for new work.

Biodiversity conservation at a landscape-scale is now widely advocated to provide a more dynamic landscape, with greater resilience to environmental change and enhanced provision of ecosystem services. This research explored whether such approaches can offer net benefits for people and wildlife in relation to site-based approaches. To do this, contrasting scenarios, were mapped, and valued, for six case study sites which were subject to existing, or planned, schemes for landscape-scale conservation.

### *Ecosystem services*

Provision of some services was enhanced by the all of the landscape-scale scenarios and, where there were losses, these tended to be compensated by gains in other services. There was a general tendency for a shift from food and fibre to carbon storage and recreation. However, there were notable exceptions where premium products, such as meat, significantly increased.

- Recreation and aesthetic values were enhanced by all of the landscape-scale scenarios and the monetary values of the envisioned recreational income were substantial in many cases. For instance, in the Great Fen, recreation was envisioned to increase by over £3.3 million.
- Carbon storage generally increased showing a particularly strong increase where arable land was converted to habitats of conservation value.
- Production of food, fibre and fuel reduced in most cases due to the loss of commercial forestry, exceptions included growth of commercial reed production. Aspirations for further development of these services was evident in consultation so benefits in this category may accrue as markets, such as wood fuel, develop.
- Flood mitigation potential was thought to be enhanced or to remain stable through a qualitative assessment. Quantitative valuation of this service remains difficult where primary data are lacking: it was identified as an aspect in particular need of further research.

Numerous assumptions are implicit in the scenarios but comparison is the aim, rather than generation of absolute values. Three methodological aspects were of particular note:

- The comparisons were highly sensitive to the value of carbon which dominated any monetary analysis. The dominance is partly due to incomplete monetisation of other services e.g. flood mitigation.
- Proxy values are relatively available but should be used with caution, as major differences in valuation can accrue. Comparison with locally derived values showed that the proxy values failed to account for variation in the product, local market forces and costs of production. This was particularly evident for timber and beef production where the value was very dependent on the specific source.
- Simplified representation of degree of increase or decrease in ecosystem services may be more appropriate than monetisation where uncertainties may obfuscate the results.

### *Biodiversity*

The impacts of the landscape-scale scenarios on biodiversity were explored through

- (i) change in area of priority habitats in relation to current area and targets, and (ii) change in landscape connectivity.
- Increases in priority habitats occurred because scenarios were built to represent project success. Envisaged increases would provide major contributions to national targets for many priority habitats and the inevitable trade-offs between priority habitats in finite space can be usefully explored through scenarios.
  - Improvements in habitat condition would also be expected under successful implementation and urban environments space-limitation may allow *only* improvements in quality, not quantity, of habitat. Further scenario modelling could consider methods for including this aspect.
  - Increase in habitat connectivity was indicated through expansion of priority habitats in the landscape, but changes in connectivity did not always follow the greatest increase in area - suggesting that spatial planning can increase connectivity while allowing for conservation of other habitats. These analyses will be enhanced in future through replacement of generalised values for movement of species in the landscape with more detailed ecological knowledge.

### *Costs and Benefits*

Costs of landscape-scale schemes were assessed as an increase compared to management costs without the schemes: these costs generally appeared to be offset by the services provided, largely due to very high carbon values. However, estimation of net costs was very challenging due to many areas of uncertainty in scenarios and ecosystem services. For instance, variations in the extent of agri-environment schemes occurring without the landscape-scale project would greatly impact costs, and yet are difficult to gauge.

The importance of including values that cannot be assessed in monetary terms (e.g. biodiversity and well-being) should not be underestimated. For future cost benefit analysis inclusion of these factors will be crucial, either by use of indices or by converting all elements to a monetary format. This aspect still requires a good solution.

### *Conclusions*

The benefits for biodiversity and ecosystem services envisaged by the scenarios endorse the support of the landscape-scale approach, assuming the successful implementation of the projects. To be *realistic*, the landscape-scale initiatives must be sustainable economically over the long term. A wide range of commercially exploited ecosystem services indicated by the case studies, such as premium meat, reeds and recreation, shows the way forward for integrating with the local economy. The domination of the combined benefits by carbon values suggests that support of many landscape-scale initiatives through carbon-offset potential should be considered, and other benefits, such as flood mitigation, may be future recipients of Payments for Ecosystem Services.

Although these market forces should be encouraged, the market alone cannot be expected to deliver the full range of ecosystem services and the challenge is to enhance natural assets with economic and social sustainability. The projects examined here showed the key importance of agri-environment schemes in delivering landscape-scale projects. Suitably targeted, this has enormous potential for enabling the restoration of an ecologically functioning landscape and further integration with research on functional connectivity and systematic monitoring will enhance these approaches.

The landscape-scale approach consolidates effort which should prevent lack of coherence and continuity in funding. Nevertheless, even for larger partnership projects, the lack of continuity in funding has been a limiting factor. Realistic landscape-scale initiatives will be well integrated with the local economy, and supported through appropriate policy instruments, to ensure that there is adequate sustainability for large temporal as well as spatial scale.

## **Project Report to Defra**

8. As a guide this report should be no longer than 20 sides of A4. This report is to provide Defra with details of the outputs of the research project for internal purposes; to meet the terms of the contract; and to allow Defra to publish details of the outputs to meet Environmental Information Regulation or Freedom of Information obligations. This short report to Defra does not preclude contractors from also seeking to publish a full, formal scientific report/paper in an appropriate scientific or other journal/publication. Indeed, Defra actively encourages such publications as part of the contract terms. The report to Defra should include:
- the scientific objectives as set out in the contract;
  - the extent to which the objectives set out in the contract have been met;
  - details of methods used and the results obtained, including statistical analysis (if appropriate);
  - a discussion of the results and their reliability;
  - the main implications of the findings;
  - possible future work; and
  - any action resulting from the research (e.g. IP, Knowledge Transfer).

Project report and annexes are provided in a separate document.

## **References to published material** ---

9. This section should be used to record links (hypertext links where possible) or references to other published material generated by, or relating to this project.

