

## **R&D Technical Summary FD1918**

# **Habitat Quality Measures and Monitoring Protocols**

### **Background to R&D project**

Physical pressures such as land claim, shoreline reinforcement and dredging continue to have extensive impacts on the extent of intertidal and other habitats around the UK coastline. Such effects can be exacerbated by coastal squeeze as a result of relative sea level rise. Habitat recreation (the creation of new habitat) or habitat restoration (the enhancement or restoration of existing habitats) can be used to alleviate some of these impacts. The number of habitat creation schemes in the UK being planned and implemented has increased markedly over the last decade. The relative newness of such schemes means that as yet we do not have an adequate understanding of the processes behind the restoration/ creation of saltmarsh and mudflat habitats. It is only through the monitoring of existing schemes that we will be able to enhance our knowledge of the parameters, and their linkages, that are important to successful scheme design.

This project is concerned with providing guidance for the monitoring of managed realignment and habitat creation sites. Such sites cover the intertidal regions of both estuaries and coastal zones and include saltmarsh and mudflat habitats. The overall aim of the project is to develop measures of habitat quality and monitoring protocols to implement these. The project therefore provides guidance for:

- the collection of better data in terms of relevance, consistency and statistical validity (including both baseline and ongoing measurements);
- the assessment of the success of habitat creation schemes; and,
- providing a basis for consistent monitoring of sites to improve understanding of site development and how this might contribute to the wider functioning of an estuary or coastal system.

### **Results of R&D project**

The task of determining the success of habitat recreation has long been challenging and sometimes contentious because the appraisal of success is dependent on the objectives of the scheme. What may be recognised as a successful scheme by one individual or organisation might be deemed as failure by another, depending on the criteria used. Each scheme that is undertaken will have different objectives and consequently different measures of success. Thus, because of the range of objectives which habitat creation schemes may be seeking to achieve, different schemes are likely to require different monitoring programmes to chart progress towards these objectives. Most of the managed realignment schemes that have been implemented to date have incorporated some degree of monitoring. The number and range of parameters monitored at each scheme, and the techniques used to undertake the monitoring have, however, been highly variable. This underlines the importance of the current project in providing guidance for the systematic design of monitoring programmes for similar schemes in the future.

There are a range of techniques available for measuring all of the parameters that have been identified as of interest for habitat creation schemes. The strengths and weaknesses and the applicability of the various techniques have been evaluated in the technical report. Following from the identification of a 'toolbox' of monitoring techniques it was possible to group the techniques into 'core tools', which are relevant for all sites, and 'optional tools' the use of which is dependent on site specific requirements. Where there is no formal requirement for monitoring it is suggested that core monitoring is still undertaken. This would incorporate, as a bare minimum, changes in elevation and habitat boundaries at a site. A large proportion of managed realignment schemes that are undertaken will, however, have statutory requirements for monitoring. Where monitoring forms a requirement for the scheme there is a

shift in emphasis from the quantity to the quality of what develops at a site. The types of parameters that should be monitored include not only the core parameters identified above but also those for which impacts are predicted, those for which mitigation or compensation objectives have been set and those which have funding conditions attached.

The selection of a technique to use for a specific scheme will also be influenced by a number of factors including the purpose of the scheme, the degree of accuracy required, available budgets and more site specific issues. All of the available tools need to be reviewed taking into account the advantages and disadvantages of each and all of these factors. There are a number of further considerations that need to be taken into account when developing a monitoring programme. These include the duration and timing of the monitoring period, ongoing evaluation of monitoring results, the expertise of the personnel involved, quality assurance procedures and the appropriate selection of sample size and statistical analysis. All of these factors can contribute to the overall success of the monitoring programme. A decision tree, covering all of these issues, has been designed to guide the user through the types of questions that need to be addressed in designing a successful monitoring programme.

The key aspects required to achieve a successful monitoring programme for a managed realignment site have been addressed throughout the report. The results of such monitoring will not only enable the evaluation of current objectives but will inform the design and management of managed realignment schemes in the future.

### **R&D Outputs and their Use**

The outputs from the project include this Technical Summary and an R&D Technical Report. The R&D Technical Report provides guidance on the assessment of scheme success and habitat quality. It provides advice on the selection of appropriate parameters to measure at a site as well as the techniques that can be used to undertake this process. The document is aimed at all organizations and individuals involved with the enhancement, management and conservation of estuarine and coastal zones.

-----  
This R&D Technical Summary relates to R&D Project FD1918 and the following R&D outputs:

- **R&D Technical Report FD1918 - *Habitat Quality Measures and Monitoring Protocols*.**  
Published June 2004

Publication Internal Status: Released internally External Status: Released to public domain

Project Manager: Adrian Dawes, Mouchel Parkman, West Hall, Parvis Road, West Byfleet, Surrey  
KT14 6EZ Tel:01932 337424 E-mail: [adrian.dawes@mouchelparkman.com](mailto:adrian.dawes@mouchelparkman.com)

Research Contractor: Natalie Frost, ABP Marine Environmental Research Ltd., Pathfinder House,  
Maritime Way, Southampton, SO14 3AE TE: 02380 338100 E-mail: [nfrost@abpmer.co.uk](mailto:nfrost@abpmer.co.uk)

The above products are available via the Environment Agency's science publications catalogue <http://publications.environment-agency.gov.uk/epages/eapublications.storefront> on a print-on-demand basis. Alternatively, they may be downloaded from the Defra FCERM Programme website [www.defra.gov.uk/environ/fcd/research](http://www.defra.gov.uk/environ/fcd/research) whose search tool is located on project information and publications page.

© Environment Agency, Rio House, Waterside Drive, Aztec West, Almondsbury, BRISTOL, BS32  
4UD Tel: (+44) 1454 624400 Fax: (+44) 1454 624409