

## Joint Defra / EA Flood and Coastal Erosion Risk Management R&D programme

### Background to R&D project

As part of the Broad Scale Modelling Theme (within the wider Defra/ EA flood and coastal defence research initiative) a scoping study was commissioned which reviewed the current status of broad scale ecological modelling and developed a future R&D programme (Broad Scale Ecosystem Impact Modelling (BSEIM) Scoping Study, FD2108 Defra & Environment Agency, 2002).

The scoping study reviewed both short and long-term R&D requirements. It established that there was a lack of practical guidance and methods available to allow the appropriate integration and assessment of ecology within existing broad scale flood risk management in England and Wales. Project FD2112 was therefore commissioned to develop good practice guidance and a 'toolbox' of methods for use by practitioners undertaking both Catchment Flood Management Plans (CFMPs) and Shoreline Management Plans (SMPs).

The overall project objective of FD2112 was to establish and demonstrate, through use of case studies, good practice procedures for data collation/ interrogation and the assessment of ecosystem effects and risks resulting from river and coastal cell management policies/options.

The guidance, toolbox of methods and case study demonstrations is provided in the Technical Report, which was prepared by a consortium led by Cascade Consulting in association with HR Wallingford, the Institute of Estuarine and Coastal Studies at the University of Hull, Royal Haskoning, Alconbury Environmental Consultants and Cambridge University.

### Results of R&D project

The BSEA guidance and methods have been developed in the context of broad scale flood risk management policy development and assessment, although it is equally applicable to any broad scale management issue such as River Basin Management Planning under the WFD.

BSEA is a GIS-based system, which uses readily available and nationally consistent broad scale data. BSEA establishes ecosystem drivers, status and function using information on hydrology, geomorphology and ecology. The primary objective is to maintain and enhance ecosystem function, following the principle that habitats and species will also be maintained and/ or enhanced.

Separate guidance and methods have been developed for both river catchments and coastal/ estuarine cells. However, the general principles and application of BSEA are the same.



BSEA involves 1) understanding the ecosystem function and status, 2) defining protection or enhancement objectives, 3) mapping and tabulating objectives, 4) consultation with expert users, and 5) using derived objectives to develop and/or appraise management policies/ options.

The BSEA guidance and methods have been applied to three Case Study areas, as follows:

- River Ribble in north-west England: identifying ecological objectives which may affect or be affected by flood risk management (linked to management action, biodiversity benefit, flood management consequence, and possible cost). To provide input to CFMP policy development.
- River Derwent in Yorkshire: a relative assessment of the ecological consequences of alternative catchment-wide flood risk management policy. To provide input to the Strategic Environmental Assessment (SEA) of a CFMP.
- South Foreland to Beachy Head coastal cell in south-east England: identifying the ecological pressures and opportunities appropriate to flood risk management. To provide input to SMP policy development, as well as the SEA of a SMP.

## R&D Outputs and their Use

The project output is the FD2112 Technical Report (TR), which presents the BSEA guidance, including the background to its development, together with the first iteration of the methods (toolbox 1). The case studies, which give a practical demonstration of BSEA, are included in the TR.

BSEA has been prepared for immediate use by practitioners in flood risk management (CFMP and SMP), which in practice will be the Environment Agency, local authorities and their consultants. The TR should also be read by policy makers such as local and national government advisors.

BSEA guidance has been designed to compliment existing Environment Agency/ Defra guidance for undertaking CFMP, SMP and/ or the SEA of these pans. The uptake of BSEA within these established planning frameworks will be dependent on, amongst others, the Environment Agency (CFMP project managers, procurement, NEAS) as well as national and local government staff.

This R&D Technical Summary relates to R&D Project FD2112 and the following R&D output:

**R&D Technical Report FD2112/TR – Broad Scale Ecosystem Assessment (BSEA): Toolbox 1.** (January 2007).

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The above outputs may be downloaded from the Defra/EA Joint R&D FCERM Programme website ([www.defra.gov.uk/environ/fcd/research](http://www.defra.gov.uk/environ/fcd/research)). Copies are also available via the Environment Agency's science publications catalogue (<http://publications.environment-agency.gov.uk/epages/eapublications.storefront>) on a print-on-demand basis.

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