

Science Project: A refined geomorphological and floodplain component to River Habitat Survey (GeoRHS)

Summary SC020024/SS

GeoData Institute and collaborator organisations have developed a series of survey and assessment procedures which adds geomorphological variables of the river, floodplain and catchment to the river habitat survey methodologies to provide a basis for enhanced indices of fluvial status.

Geomorphology is inherent within River Habitat Survey (RHS) methodologies, but is limited in scope and does not extend to the floodplain environment or consider the catchment within which the reach is situated. This two-phase project has reviewed the potential and provided a proof of concept for extension of the survey approach in relation to the range of riverine and floodplain applications that might use more detailed or targeted geomorphological information.

The need for the project was identified through the Sediment and Habitats Concerted Action Workshop which sought refinements to the RHS methodology. Development of the methodology has drawn from findings of earlier R&D particularly in terms of recording standards from W5A-064/TR (Impact of Recent Floods on Channel Morphology and Physical Habitat using RHS Re-Survey).

Geomorphological information is seen as contributing to flood risk management and catchment management planning and operational requirements. The needs of reporting within the Water Framework Directive, particularly with regard to typology, physical reference condition and reporting on pressures and impacts have also been considered.

Under Phase I the development and consultation on methodologies for field-based survey of the enhanced geomorphological and floodplain component were undertaken. The resulting field survey form and guidance manual equivalent to the RHS survey handbook were tested with survey of reference condition sites and through training delivery. Phase I also developed an approach to collection of attributes

from secondary sources through desk study and remote sensing techniques.

Phase II has refined these approaches further, providing updated field survey forms and training materials. The desk study elements have been built into an operational methodology using GIS-based tools developed for the Environment Agency and the Scottish Environment Protection Agency. These ArcGIS applications have been installed within the Environment Agency and SEPA offices and generate a spatial database of morphological attributes. Separate MS Access databases have been developed to support the entry and analysis of the GeoRHS and RHS field survey records.

Geomorphological staff within the Agencies have been trained both in the field methodologies and in the desk-based data extraction procedures.

GeoRHS Phase II has undertaken field survey on a series of reference conditions sites across England, Scotland and Wales to test the methodology and provide a dataset from which to examine the development of indices. A series of sites on the River Laver have also been used to test the effectiveness of the attributes. The information will be used, typically in tandem with RHS data, to develop indicators of channel and floodplain naturalness, modification and status. The information will help set river channel and floodplain sites in the context of reference conditions and provide a basis of monitoring.

Two broad indices, drawn from a wider list of potential applications, have been developed within the scope of this programme. These are focused on flood risk management and Water Framework Directive application areas. These indices are derived via a scoring and weighting based approach, similar to the HMS and HQA within RHS.

The methods and indices are aimed at the Environment Agency, SEPA and DoE NI as a basis of

a wider range of applications and monitoring requirements within the catchment, floodplain and river channel environments. A series of issues are raised within this research that will need to be addressed within agency-wide implementation, and further stages in the development of the methodology and the priorities for additional indices development and testing are outlined.

This Summary relates to information from Project SC020024. Findings are reported fully in the following output(s):-

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Project Manager

Jim Walker, Northwest Region

Research Collaborators:

Dr Julia Branson (GeoData)

Chris Hill (GeoData)

Duncan Hornby (GeoData)

Dr David Sear (GeoData)

Professor Mike Clark (GeoData)

Professor Malcolm Newson (University of Newcastle)

Dr Nigel Holmes (Alconbury Environmental Consultants)

Dr Helen Dangerfield, (Posford Haskonig)

Research Contractor

GeoData Institute, University of Southampton,
<http://www.geodata.soton.ac.uk>

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© Environment Agency
Rio House, Waterside Drive
Aztec West, Almondsbury
Bristol BS32 4UD

Tel: 01454 624400 Fax: 01454 624409