

Digital Good Practice Manual: Identifying mitigation measures for good and maximum ecological potential

Science Summary SC060065/SS

A new series of reports published by the Environment Agency explores ways of mitigating the effects of flood defence and land drainage schemes on rivers, lakes and coastal waters.

Over the last 20 years, considerable progress has been made in mitigating the impacts of flood risk management (FRM) activities on water bodies. The European Centre for River Restoration (ERRC) and UK River Restoration Centre (RRC) have acted as catalysts since 1990 to promote river restoration. There is renewed effort in Europe with the new Floods Directive and Flood Management Plans exploring alternatives to enhance storage in floodplains, recreate wetlands and remove hard engineering structures on some rivers.

The first report in this series covers Phase 1 of the development of a Digital Good Practice Manual, providing a checklist and guidance for assessing whether a flood risk or land drainage scheme represents good environmental practice and, if not, what further mitigation measures/techniques could be used without adversely affecting the flood defence or land drainage objectives. This report covers activities on rivers, lakes, estuaries and coastal waters aiming to comply with requirements of the Water Framework Directive (WFD) but without having adverse impacts on their use (and taking into account costs). The Digital Good Practice Manual is provided in a parallel report.

The first report describes a series of flood risk management (FRM) trials on heavily modified water bodies (HMWBs). The results of these trials (and iterative development of checklists) has fed back into the broader work of the government advisory group known as UKTAG, which has coordinated trials in all water sectors, including ports, navigation, water resources and hydropower. The report covers four trials conducted primarily for FRM, namely:

- Hogsmill Stream (FRM - rivers)
- Lower Thames (FRM – rivers and navigation)
- River Irwell (FRM – rivers)
- Pagham (FRM – transitional/coastal waters)

For the trials, UKTAG recommended testing three approaches (A, B and modified A) to determine whether a water body is below, close to, or at good ecological potential (GEP). The main finding of this report is that GEP cannot be determined per se by the UKTAG decision-making tool alone (whichever of the suggested approaches is adopted). Whilst from an FRM perspective UKTAG Approach B is the most user-friendly, even this process does not allow a conclusion to be drawn on whether the water body is at, below, or above GEP. Conclusions from the FRM trials are that expert judgment is needed and UKTAG Approach B is recommended as a means of transparent recording of the audit trail. Equally important are the experts' comments that are likely to arise and these should be recorded by the scribe. It is very probable, for example, that a water body might be judged to be close to or at GEP from an FRM perspective but to be degraded by activities unrelated to one of the recognised sectors (for example, the Lower Thames has piecemeal bank protection by riparian landowners).

In addition to reporting the outcomes of the trials, this report makes recommendations on the classification process of all HMWBs. It is suggested that the process of classification takes place at regional meetings with the help of nationally-trained facilitators to ensure consistency across all areas. Time constraints (the need to classify a large number of water bodies in a short period of time) and the views of experts with knowledge of their patch may force grouping of water bodies together (for example, based on similar characteristics of adjacent water bodies) or similar river, transitional water, coastal or lake types. Thus if a template is developed for one water body, this might be extended (with tailoring and recording of differences) fairly rapidly to similar types in the area, region, or indeed nationally. Some guiding principles for grouping water bodies are given in this report.

The second report in this series is a review of techniques compiled for rivers, lakes, transitional waters and coasts. This is based on an extensive literature review (including internet searches) and telephone or

face-to-face interviews with practitioners from the UK and Europe. The report includes a synthesis of the information collected, a description of the studies covered and an initial screening checklist. It also covers European initiatives for tackling flood risk management (FRM) and land drainage (LD) issues.

There is considerable information on rivers, much less so for transitional waters and coasts and very little for lakes. For the report, many hundreds of papers were obtained and reviewed from readily accessible sources. There is much previous experience to draw upon and the literature can be split into user manuals, grey (or unpublished) literature and published scientific papers.

Whether a scientifically proven ecological benefit has arisen as a result of a measure/technique is assessed according to the scientific literature. This is distinct from the 'basis for use' of an individual measure/technique described in the checklists, which is a mix of user manuals and grey literature (reflecting more localised experiences) as well as scientific literature. Much data/information held by operational staff has never been published (indeed, many experts do not have the incentive to publish their experiences and monitoring results). Interviews and questionnaires carried out for this report indicate that the depth and breadth of scientific monitoring and publications remains low compared to the large number of projects completed.

Scientific information can be (cautiously) imported from other countries such as the USA. However, the number of papers remains low for many measures/techniques. For many physical environments, there will not be any directly applicable information. Lack of monitoring is a problem that has been flagged up by practitioners for more than two decades and remains a weakness (there is rarely any baseline data).

Flood mitigation measures are most likely to be successful when properly designed and developed. For the majority of projects in Europe and the UK, there has been little or no monitoring. A project also needs to have a minimum combination of geomorphological, ecological and engineering expertise (and in urban areas, a contaminated land expert and landscape architect) to be successful. It is also important to consider the opportunities and difficulties presented by mitigation measures and to arrive at a balanced view which inevitably will be site-specific. Thus, the Digital Good Practice Manual cannot be made prescriptive, but should be used to guide decision-making.

This summary relates to information from Science Project SC060065, reported in detail in the following outputs:

Science Report: SC060065/SR1
Title: Digital Good Practice Manual: Phase 1 Report (review of techniques)

ISBN: 978-1-84911-094-5 **August, 2009**
Report Product Code: SCHO0809BQWK-E-P

Internal Status: Released to all regions

External Status: Publicly available

Science Report: SC060065/SR2
Title: Digital Good Practice Manual: Identifying mitigation measures for good and maximum ecological potential

ISBN: 978-1-84911-095-2 **August, 2009**
Report Product Code: SCHO0809BQWL-E-P

Internal Status: Released to all regions
External Status: Publicly available

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This project was commissioned by the Environment Agency's Science Department, as part of the joint Environment Agency/ Defra Flood and Coastal Erosion Risk Management Research and Development Programme.

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