

Evidence

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Appraisal of river restoration effectiveness: Seven Hatches

Project summary SC070024/a/b

Royal Haskoning, in collaboration with experts from the River Restoration Centre and the Environment Agency, recently published two reports on the use of different measures to assess the effects of a river restoration scheme at Seven Hatches on the River Wylye in Wiltshire against site-specific environmental objectives aligned with the Water Framework Directive (WFD). Seven Hatches was the primary case study in research carried out as part of the broader Environment Agency project, 'Managing Hydromorphological Pressures in Rivers'. Two similar reports are available for a case study at Shopham Loop on the River Rother in southern England.

The case study report describes the measures put in place at Seven Hatches and the effects of the scheme on physical and biological quality elements adopted for the WFD. The other report provides further details of the monitoring performed and describes the analysis techniques and interpretation of the results.

The Seven Hatches scheme, which was implemented in 2007, involved channel narrowing, introducing gravel riffles, erecting a fence to prevent livestock access to the river, selective tree felling and a planting scheme. Monitoring took place pre restoration in 2006 and post restoration in 2008 and 2009 at both the restoration site and a control site upstream.

Although all the WFD's hydromorphology objectives were met in the direct vicinity of the measures, it was not possible to determine the full magnitude of change due to the relatively short timescales for monitoring and the lack of geomorphologically relevant flow events during this period.

The assessment against the WFD's biological objectives indicated that overall macrophyte coverage and the extent of species that prefer faster flowing water had increased at the restoration site. However, the improvement could not be attributed to the restoration measures because an even greater response was observed at the control site, though this was not seen in the wider catchment.

The impact on macroinvertebrates was difficult to identify due to the high species diversity at the restoration and control sites before the restoration and a lack of replicate survey data. The restoration measures appeared initially successful in increasing the population of fish that prefer faster flowing water.

Despite not being able to draw firm conclusions on the response to restoration of some aspects of the river biology, the scheme was deemed effective in localised areas in providing hydromorphological conditions that were more conducive for the range of biological quality elements expected in the river. Continued monitoring at Seven Hatches is recommended as many of the effects of the restoration will take longer to become apparent.

The approach taken for the restoration at Seven Hatches is transferable to other chalk streams. However, the effects of river restoration are likely to be localised, particularly in the short to medium term and may not be detected at the water body scale.

Lessons learnt from the case study related to scheme design and implementation, setting of objectives, monitoring approaches and sharing experience:

- Understanding how restoration measures impact on restoring hydromorphological processes will improve our ability to design successful schemes.
- Setting project and monitoring objectives that link hydromorphological change and ecological response, are important. Objectives should reflect catchment context, historic conditions, other pressures and recovery timescales.
- Monitoring data should be collected for long enough to give the system time to re-equilibrate.
- Publishing results will improve the evidence base and establish what restoration techniques work in which situations and which monitoring techniques work best. It is also important to understand where schemes have worked and where they have been unsuccessful.

The project's findings will link with other work by the Environment Agency to help understand more about the effectiveness of river restoration schemes and how this can be measured. The findings also provide examples of how to manage hydromorphological and sediment pressures in catchments to achieve WFD objectives.

This summary relates to information from SC070024, reported in detail in the following outputs:

Report: SC070024/a

Title: Appraisal of river restoration effectiveness: Seven Hatches case study report

Report: SC070024/b

Title: Appraisal of river restoration effectiveness: Seven Hatches monitoring report

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Project managers: Natalie Kieboom (née Phillips), Judy England, Evidence Directorate

Research Contractor: Royal Haskoning UK, Burns House, Harlands Road, Haywards Heath, West Sussex RH16 1PG, UK. Tel: 0144 445855

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E: enquiries@environment-agency.gov.uk.

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