the River Restoration Centre

Working to restore and enhance our rivers

Delivering River Restoration: Recipes for Success

13TH ANNUAL NETWORK CONFERENCE

Restoring Europe's Rivers

ACE · AlaskA · ARUP · Cain · Halcrow A CH2M HILL COMPANY · LAND & WATER Services · Penny Anderson Associates Ltd Consultant Ecologists · ROYAL HASKONING Enhancing Society · rshydro · Salix · WILLOWBANK Erosion & Conservation Services · WLW

Kentchurch Weir Removal

River Restoration Centre Conference

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Alex Humphreys, Civil Engineer

Introduction

- Strategic Level Assessment
  - Description of the Structure
  - Assessment of the “impact zones” upstream and downstream
  - Initial assessment of feasibility of structure removal
  - Summary of Risks and Opportunities associated with removing the barrier
- Feasibility Study
  - Geomorphology
  - Flood Risk Assessment
  - Structural Assessment
  - Heritage Assessment
  - Risk of Contamination
- Detailed Design
  - Impoundment Licence
  - Sediment Sampling and Chemical Analysis
  - Bathymetric Surveys
  - Preparation of Works Information
- Construction
  - Time Lapse Photography
  - Management of Silts

Kentchurch Weir

- Masonry and concrete weir on River Monnow.
- Slight skew alignment across watercourse.
- Historic structure that used to provide water to a mill.
- Current weir thought to be modern reconstruction, though historic presence of weir thought to date back centuries.

Strategic Level Assessment

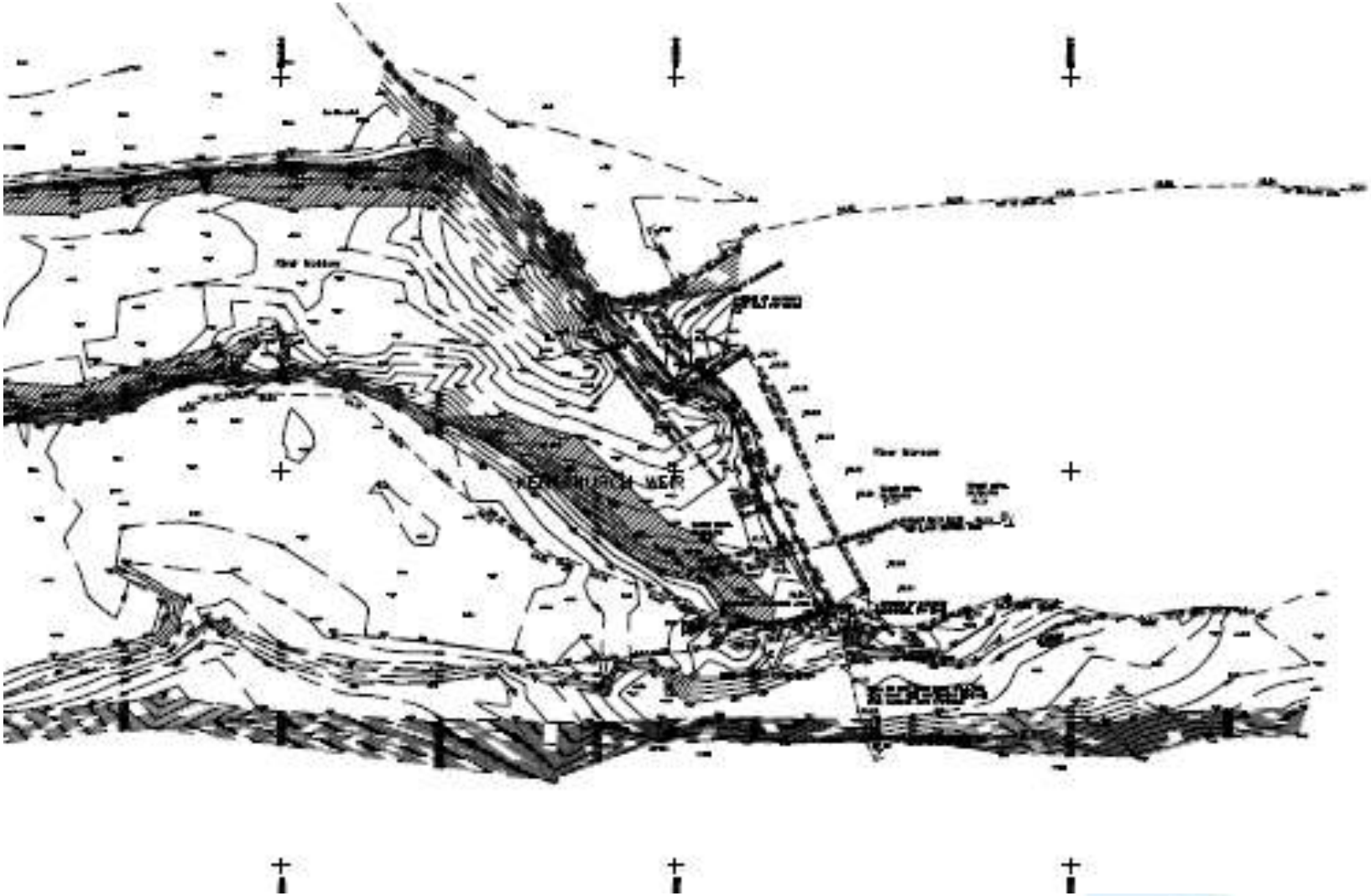
- Initial site walkover to assess structure and its surrounding.
- Early assessment of risks and opportunity to determine whether there is justification to consider barrier removal in more detail.
- Identify the site features that will need to be considered in detail as the project develops.

Feasibility Study

Management of Uncertainty and Risk

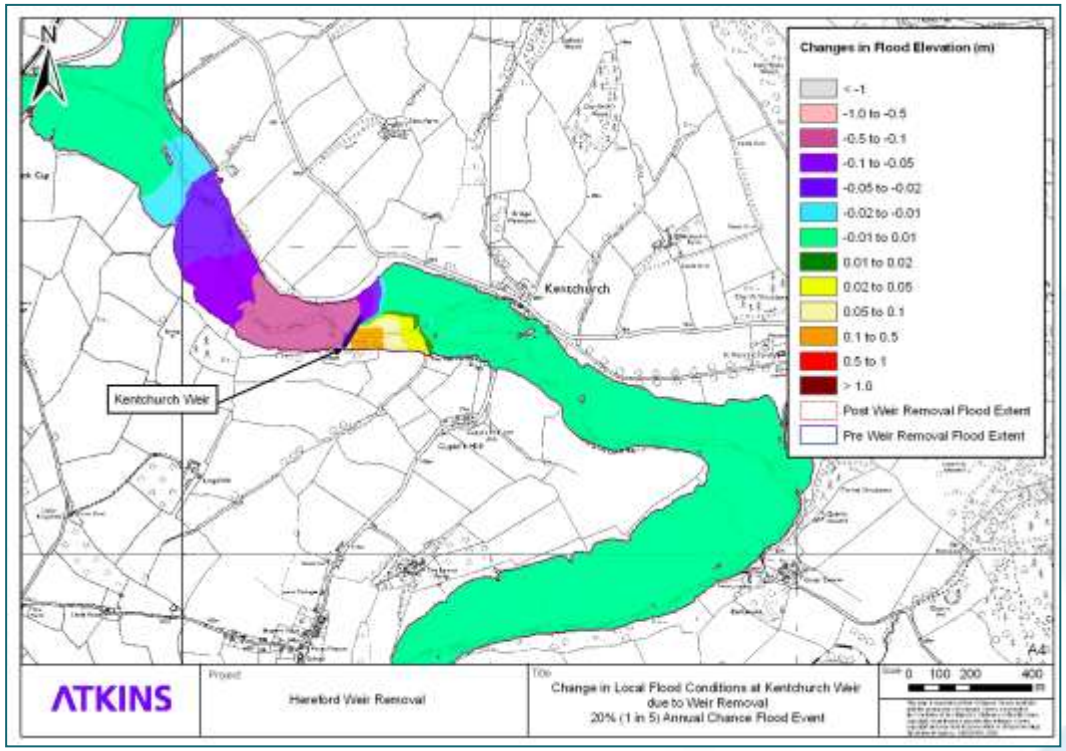
- Initial Strategic Level assessment to identify key risks
- Uncertainty should reduce throughout the appraisal process
- Identify further supporting studies that would reduce risk:
  - Bathymetric survey
  - Sediment sampling
  - Heritage studies
- Extent of channel adjustment is an unpredictable and uncertain process

Assessment of Change in Bed Profile



Flood Risk Assessment

- Modelling the pre- and post-removal scenarios
- Broad scale modelling to look for a trend
- Flood Hydrographs routed over a Digital Elevation Model
- TUFLOW
- Focus of the study was the impact of losing flood storage upstream of the weir site and potential increase in peak discharges downstream



Demolition Works

- Preparing the Contract Documents
- Liaising with Environment Agency Pollution Control
- Supervision

Inspecting the River Following Removal

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Future Commitments

- Monitoring change in upstream and downstream reaches
- Impacts on existing infrastructure
- Maintenance of bank stability
- Sediment Issues
- Funding for reactive maintenance
  - Capital funding for projects vs. revenue funding for maintenance
- River Trusts to maintain river banks?

Lessons Learned & Future Developments

Lessons Learned

- Pragmatic Risk-based Approach
- Avoid making decisions too early
- Develop a robust database of costs of completed schemes
- Good baseline data (e.g. Fish surveys at sites, record drawings of structures)

Future Developments

- Develop the risk assessment techniques
- Review cost estimates as more schemes are completed
- Analyse monitoring results to inform future studies