



JBA
consulting

Holnicote Multi-Objective Flood Management Demonstration Project

Modelling Elements

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Objectives

- Identify landscape scale land management change required to mitigate downstream flood risk
- Multiple benefits – habitat creation; landscape, nature and soil conservation; carbon stewardship; buffering against diffuse pollution; providing public access, information and learning opportunities

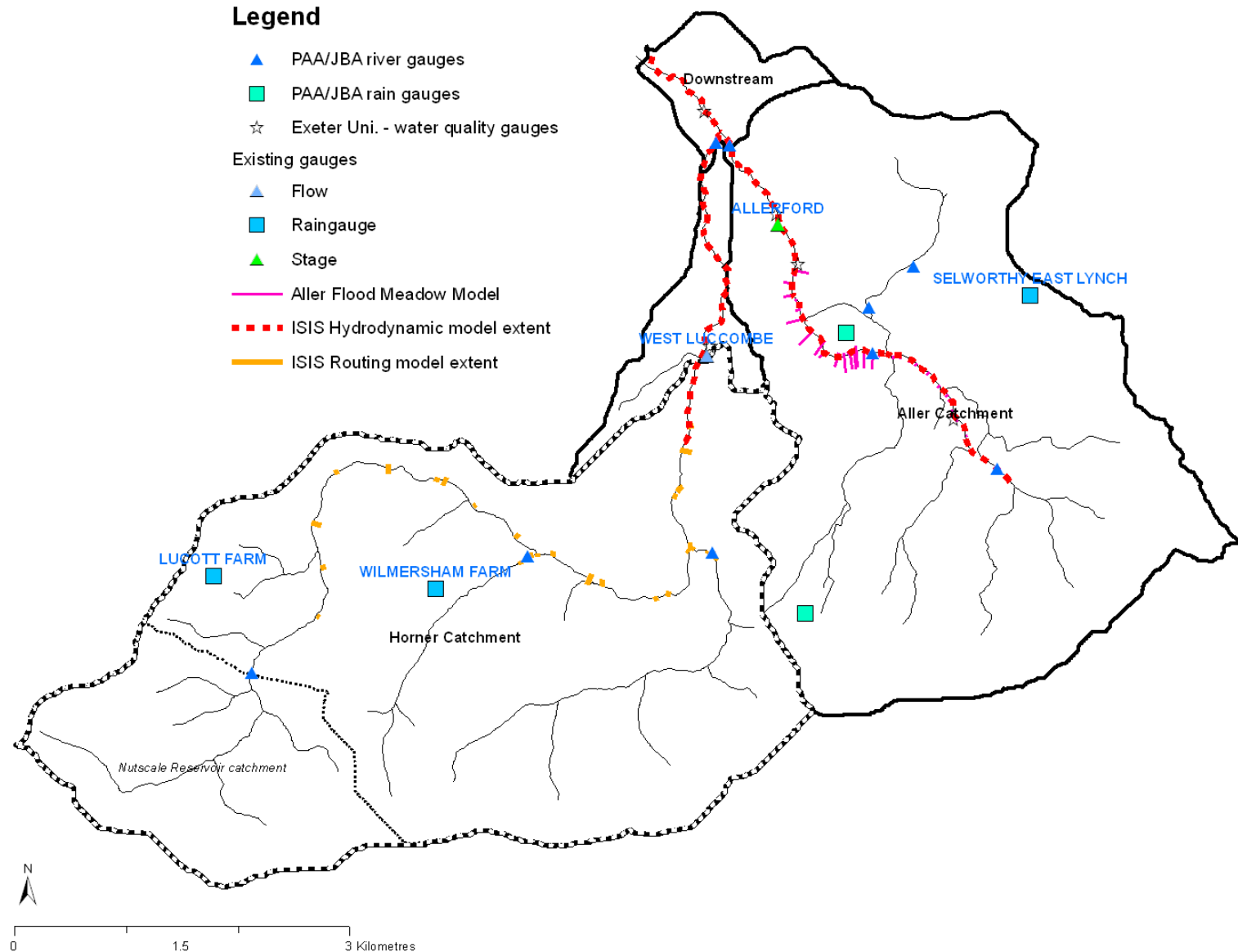
Investigations

- Hydrological monitoring
 - Hydrological and hydraulic modelling
 - Water quality & ecology assessments
 - Ecosystem services assessment
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Land management changes under consideration

- Moorland restoration – including heather restoration, **surface drainage management (on tracks, paths and roads) and grip blocking**
 - Woodland extension
 - Large woody debris dams
 - Implementation of best practice land and soil management
 - Intervention in direct / rapid hydrological flow pathways between hillslope runoff generation areas and receiving arterial watercourses
 - **Creation of flood meadows**
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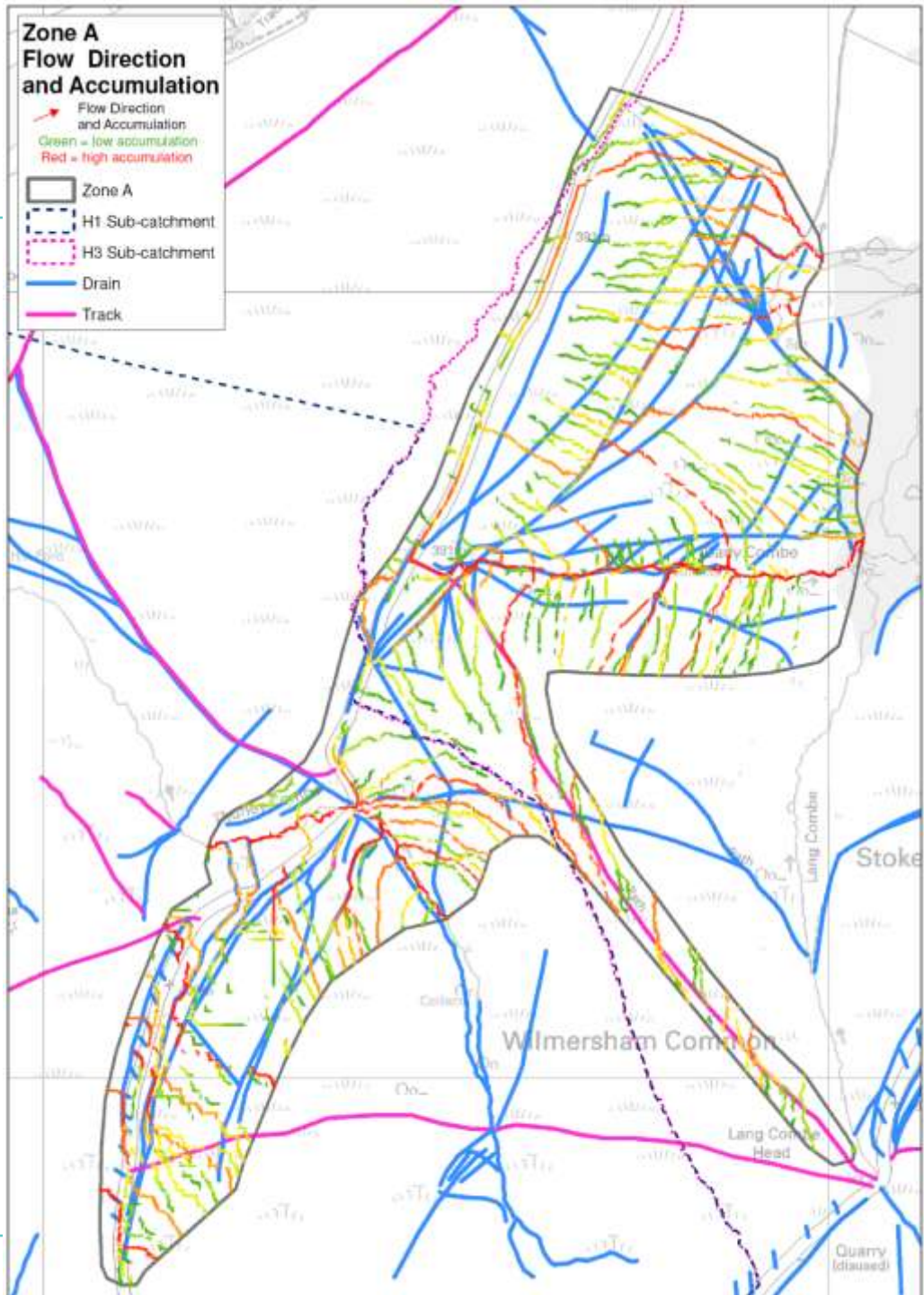
Hydrometric monitoring and hydraulic models

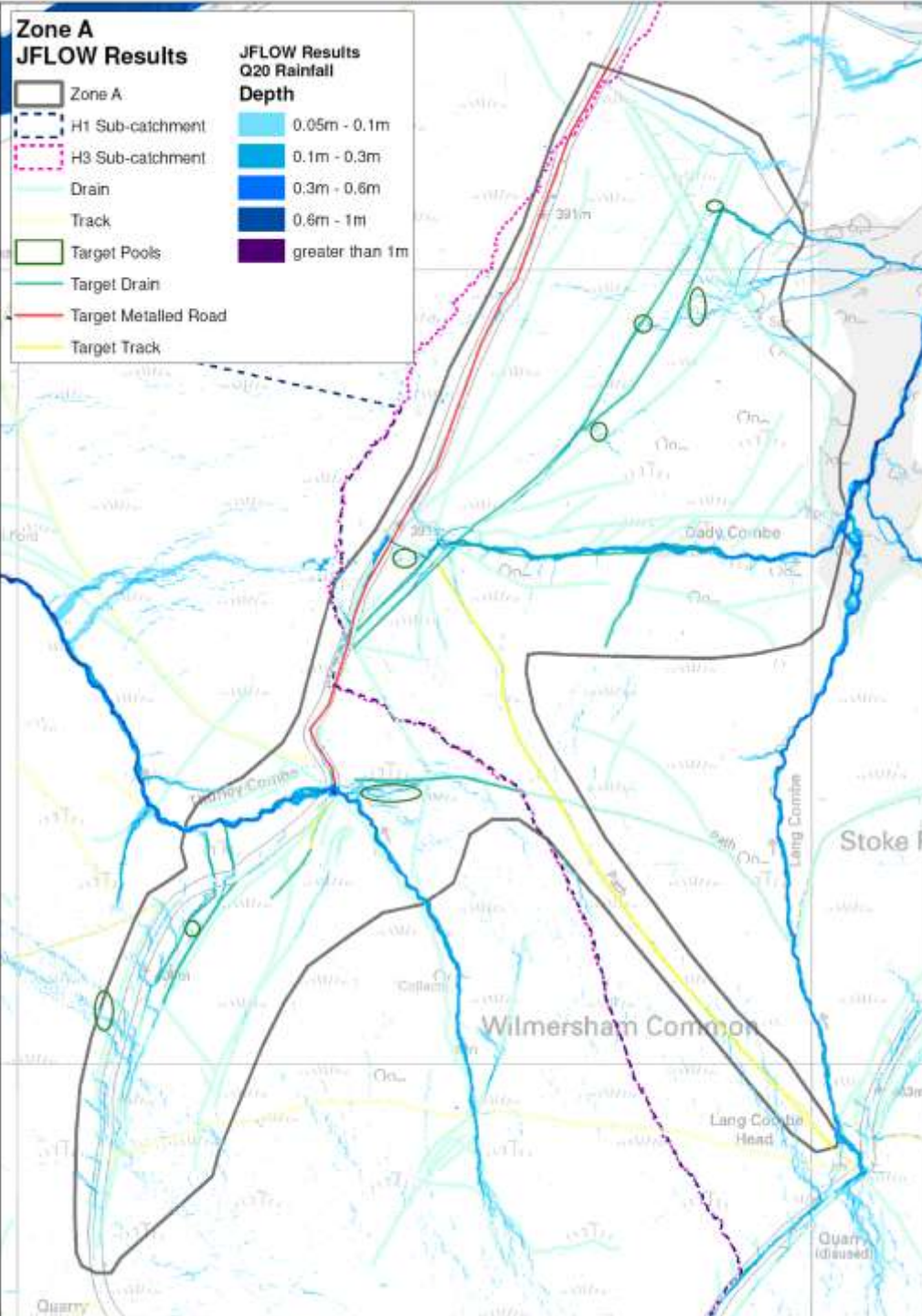


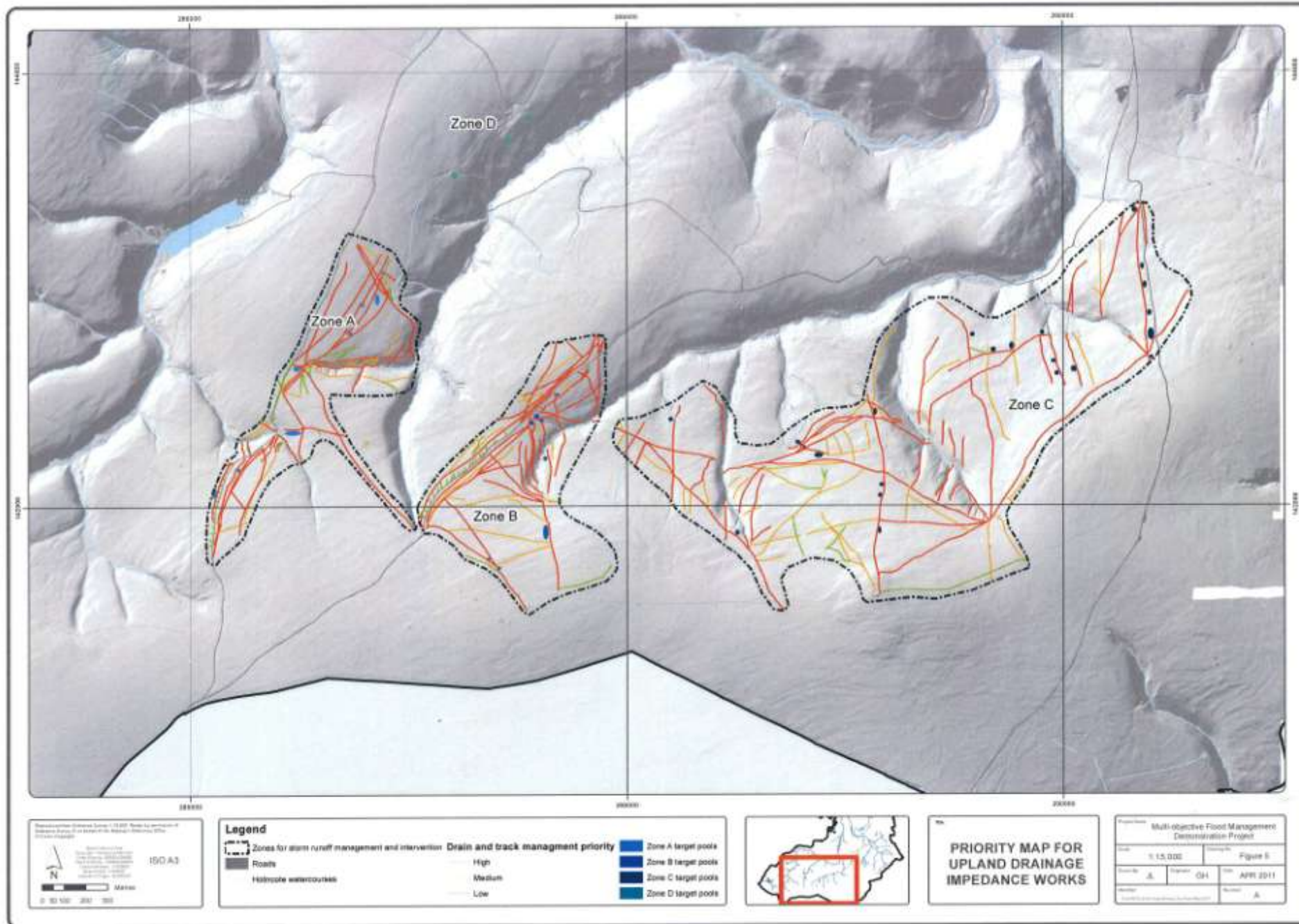
Moorland surface drainage management

Tasks

- Identify key flow pathways by GIS analysis of LIDAR DTM
 - Identify natural flood storage areas by surface water flood modelling
 - Identify target areas for flood attenuation measures
 - Ground truth with site assessment
 - Modifications for environmental and heritage/archaeological constraints
 - Instruct and supervise ground works contractors
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Flood meadow creation

Tasks

- Build a linked 1D-2D ISIS-TUFLOW hydraulic model
 - Explore current flooding mechanisms
 - Assess flood meadow design options
 - Quantify flood risk management benefits (flow, stage, timing)
 - Provide supporting material for regulatory / consenting process
 - Provide supporting instructions to ground works contractors
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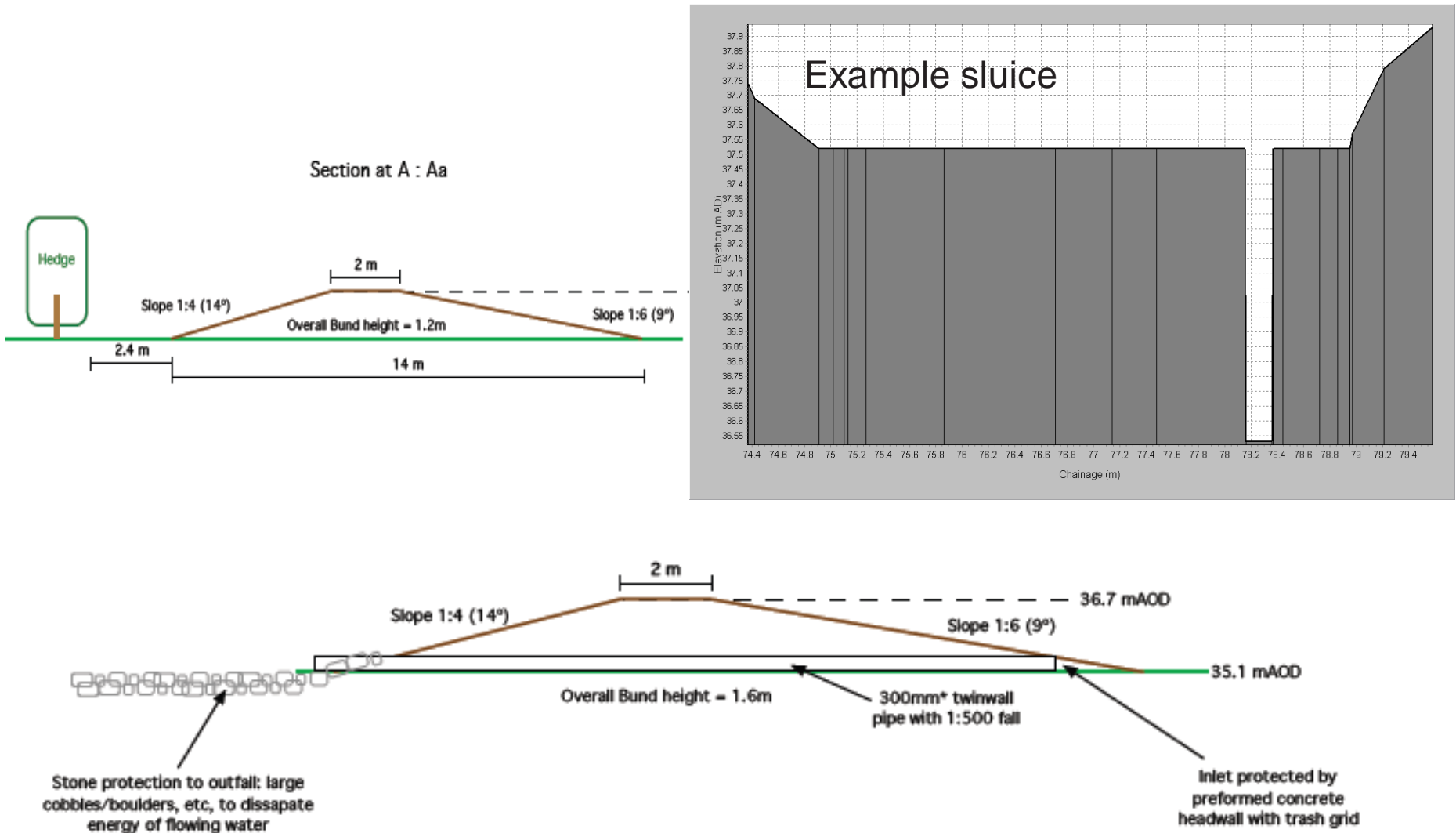
Aller baseline model



Elements of the proposed design

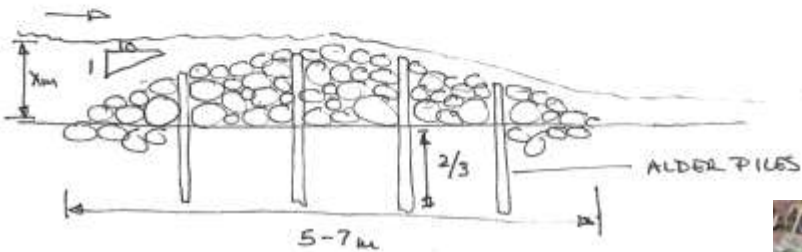


Proposed design for consultation

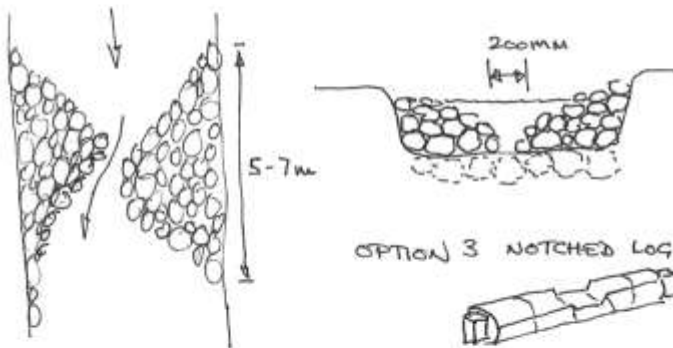


Alternative sluice / bed raising designs

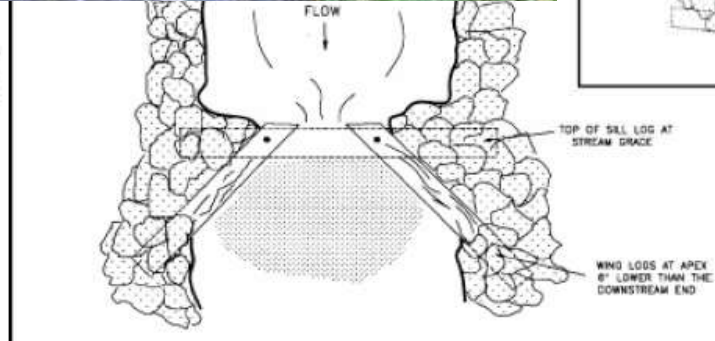
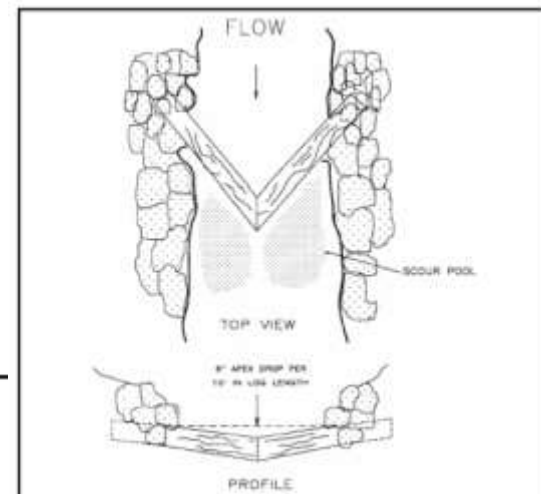
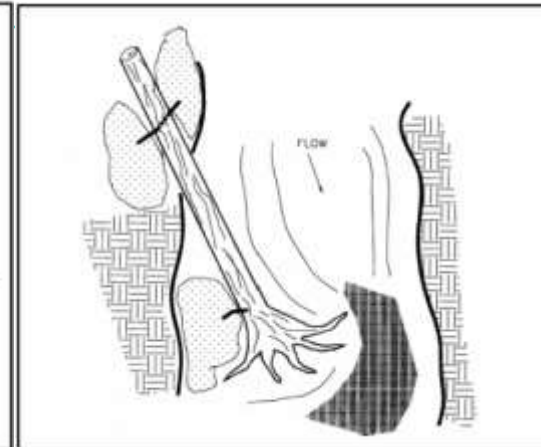
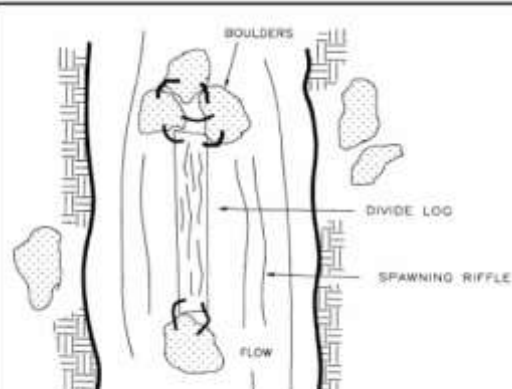
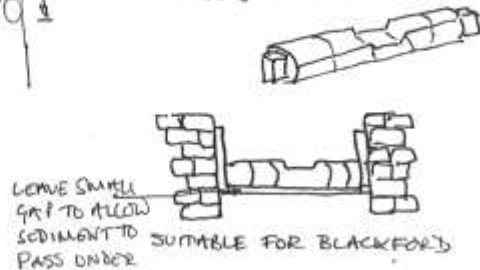
OPTION 1. LOW BOULDER RIFFLE
SUITABLE FOR ALLERFORD



OPTION 2 'V' NOTCH BOULDER WEIR
SUITABLE FOR ALLERFORD
STONE SIZE 4X LARGER THAN ANYTHING FOUND ON
SITE.



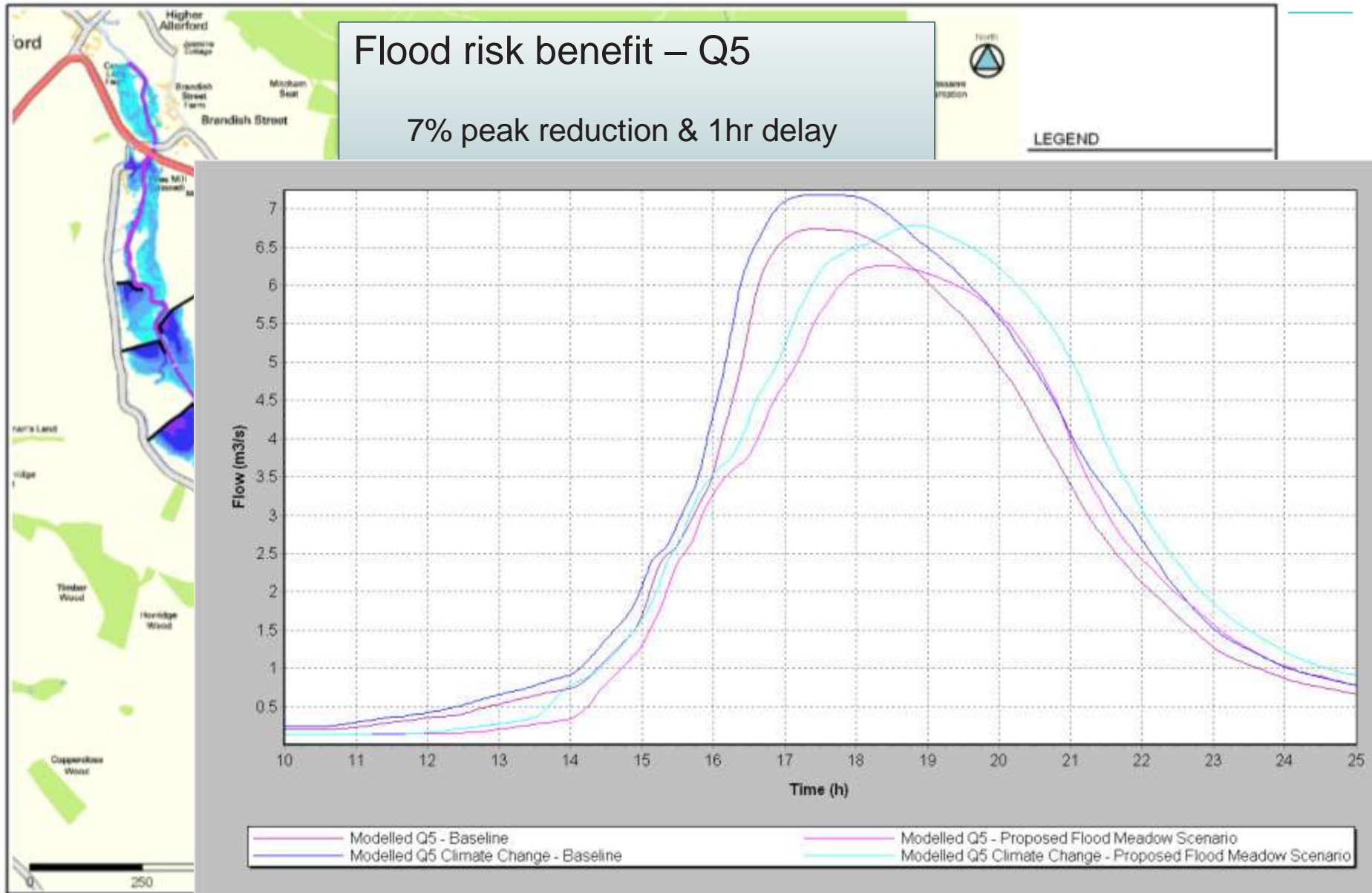
OPTION 3 NOTCHED LOG.



Modelled flood meadow impact

Flood risk benefit – Q5

7% peak reduction & 1hr delay





Lessons learned

- Modelling can assist in opportunity mapping, impact assessment and development of intervention design
 - Early dialogue with stakeholders on land management or catchment interventions to collect local knowledge, identify issues and constraints
 - Early dialogue with relevant regulatory, planning and consenting authorities on proposed interventions
 - Appreciation of potential conflicts between policy areas with respect to some interventions
 - Understanding of the considerable time period it takes to identify, approve, implement and establish land management changes
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