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Dorset Peat Partnership

Site Hydrological Assessments

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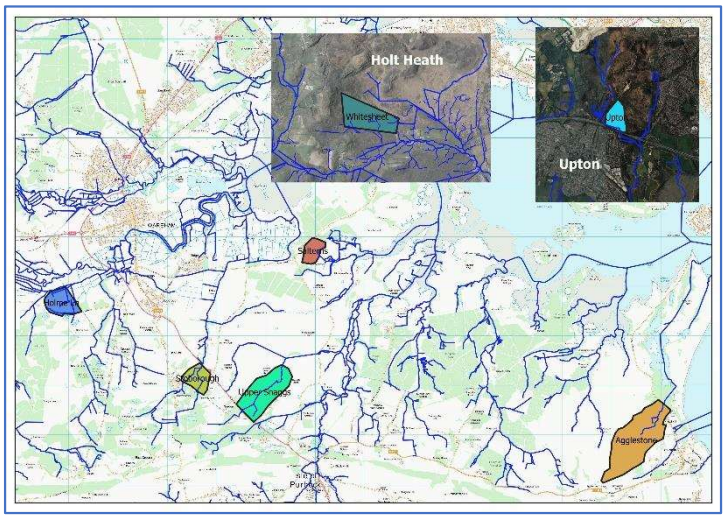
Introduction

Dorset Peat Partnership require further hydrological advice for some of their Year 2 (April 2024_March 2025) delivery sites. Further details are required to ensure that the best appropriate restoration plan is provided.

There are seven sites being considered:



- Snags Valley - mapping of land drains & specification for Stage 0 in the Upper Snags Valley;
- Holme Lane Bog - drainage patterns;
- Lower Agglestone (Lower Mire) - drainage patterns, sediment composition, topography;
- Salterns Copse (Arne Peninsula) - drainage patterns;
- Stoborough Heath - drainage patterns;
- Upton Heath - drainage patterns; and
- Whitesheet southern mire - drainage patterns.

Methodology

A simple desk-based assessment of available spatial data sets (GIS) is required to initially understand the topography and flows/drainage of the sites. The findings are then compared to current restoration plans and where appropriate modify or build on the existing approach.

A follow up rapid site visit was also completed to ground truth desk-based analysis and refine with local observations.

The Upper Snags Valley site was also considered in further detail for potential to restore full floodplain connectivity (Stage 0).

Restoration Approach

Generalised principals for restoration have been applied to each of the sites:

- Maximise supply of a diffuse flow to the flatter areas;
- Retain water on flatter sites for as long as possible;
- Restore modified channels to reduce drainage of water away from sites. Modifications can include incised, embanked, straightened or realigned planforms;
- Connect flow to adjacent “floodplain” areas as frequently as possible.

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Site 10 Agglestone

Summary of key observations:

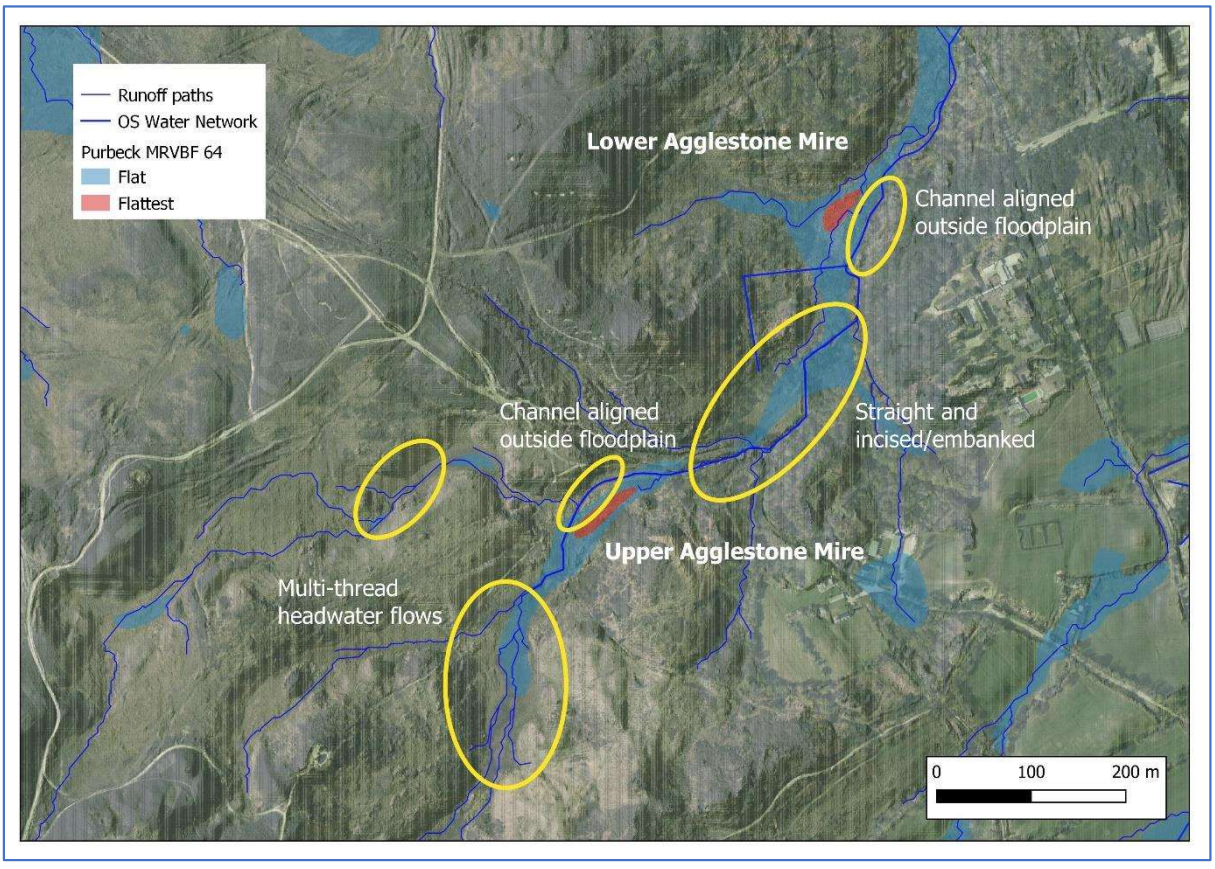
- Relatively natural, multi thread headwater flows concentrate into managed channels;
- Modified channels have been diverted outside of the natural (topographic) floodplain surface;
- Straight and incised/embanked channels detach flow from adjacent floodplain areas; and
- Modified channels are eroding downwards with potential headcut/knickpoint erosion leading to rapid change in bed level.

Flow Paths and Natural Floodplain:

Watercourse data is from OS Open Water Network and Environment Agency Flow Pathways data set.

Natural floodplain definition is from analysis of flatness on Environment Agency 1m LiDAR Digital Terrain Model. Flatness represents a combination of slope angle and relative elevation. Flattest areas are shaded in red, with the wider extent of flat area shaded in blue.

The concentration of flow within the topography is represented by flow vectors showing directions of surface flow.



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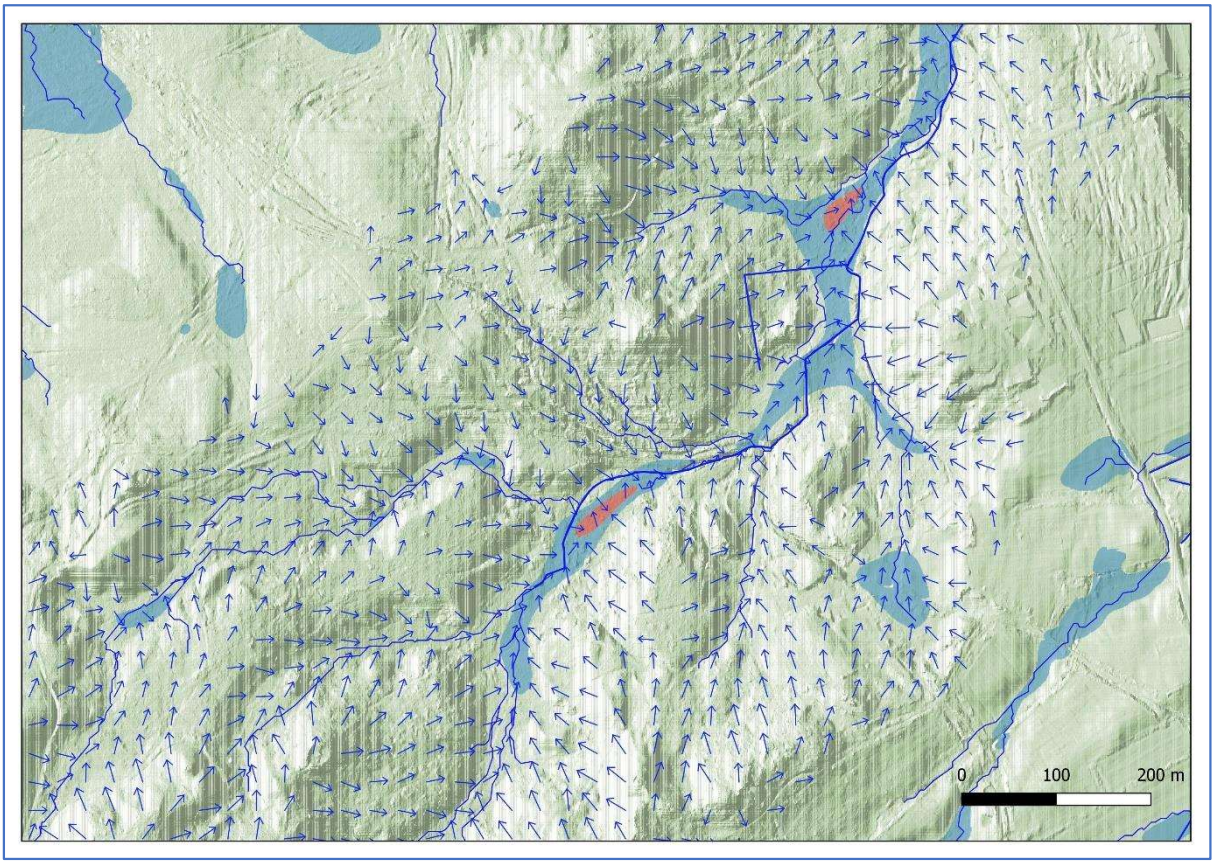

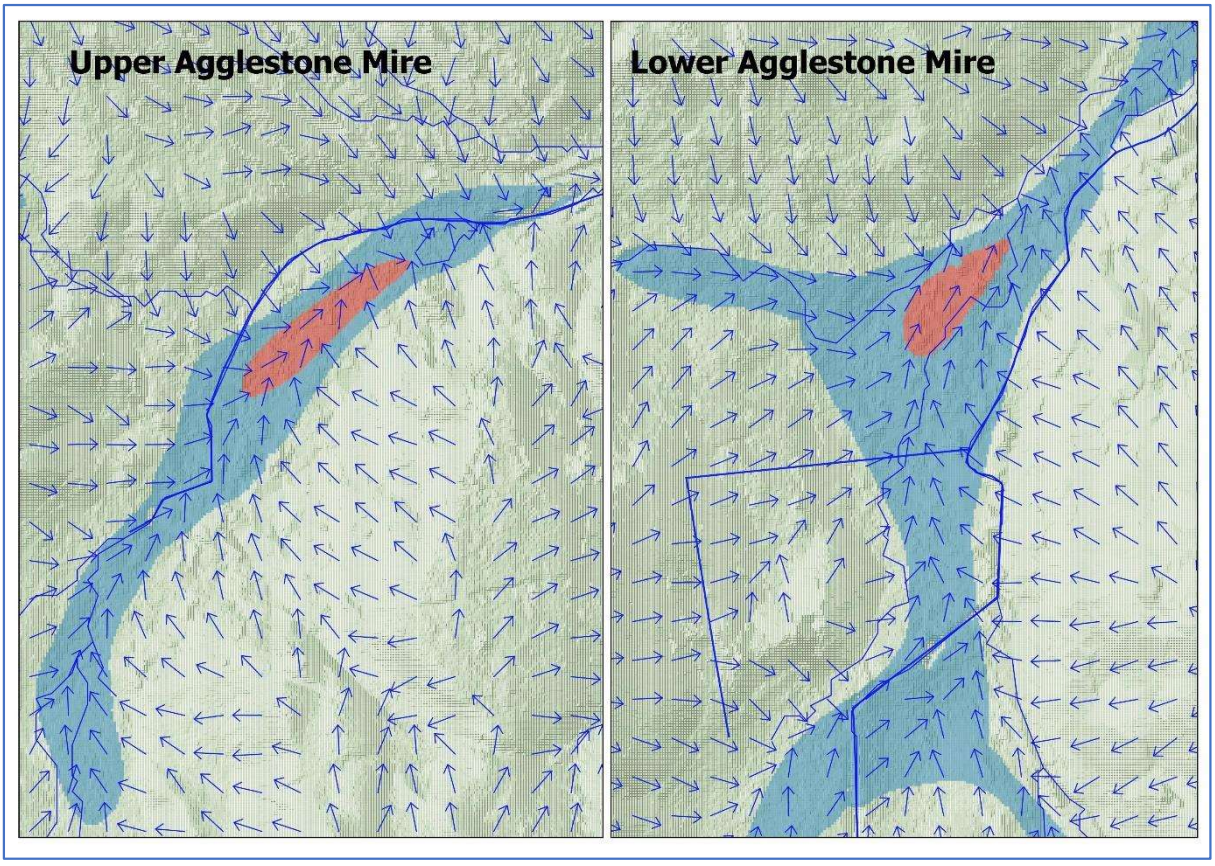

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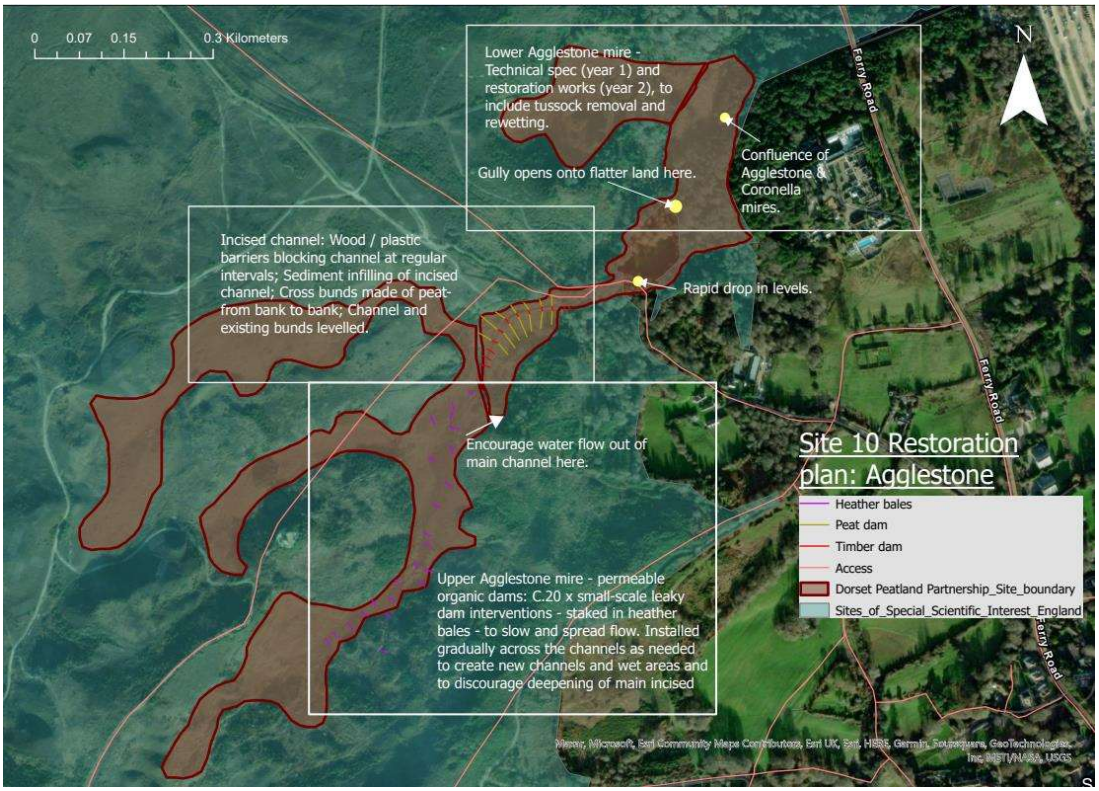
Restoration Options:

Current plans



Potential refinement (ref maps below):

- (broadly in agreement with existing approach for Upper Agglestone Mire);
- (1) hold water back/slow flow in headwater areas;
- (2) and (3) address realigned channel and retaining embankment to connect flattest area;
- (4) attempt to raise channel bed level by addition of woody debris;
- (5) potential connectivity to floodplain area on right bank (looking downstream) where channel is straightened /incised /realigned. Infill channel with woody debris and lower right bank embankment. Lower embankment at a downstream point to return flow;
- (6) connectivity to topographic floodplain where channel is realigned outside floodplain. Infill channel a viewing point and direct flow onto lowlying natural floodplain. Note that flow may spill "backwards" in a south-westerly direction to occupy lower topography. The point of reconnection is the simplest mechanism.

Details and locations shown below.

Analysis of relative levels (REM) on the floodplain with reference to the current channel also shown. Areas in red are lower than the current channel.

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