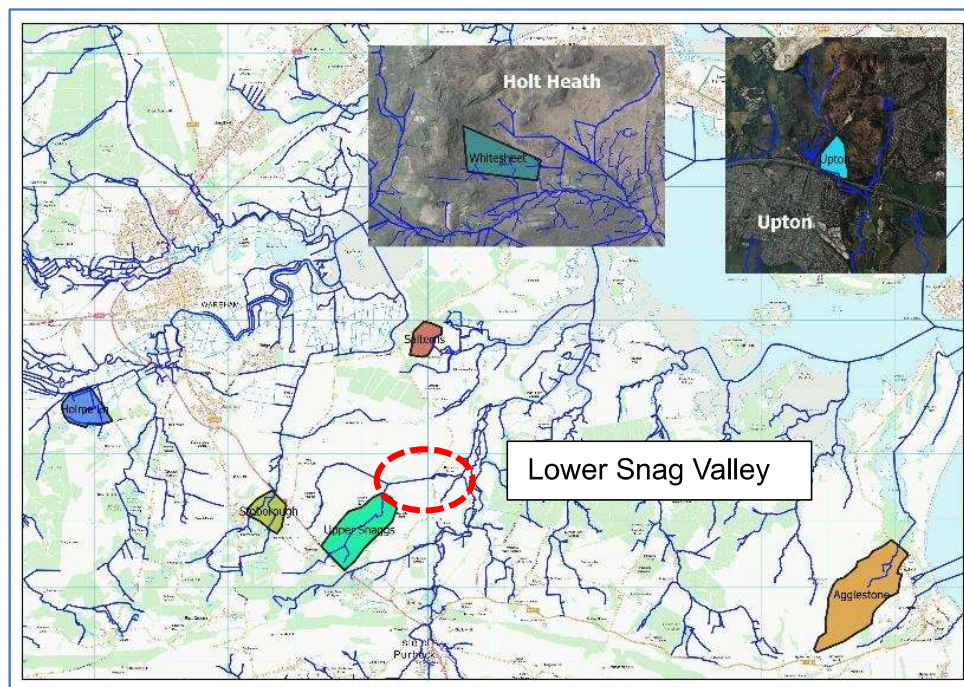


Introduction

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.

A previous report (Dorset Peat Partnership Hydrological Assessments) considered seven sites. An update is provided to cover a further area in the downstream Lower Snag Valley. An understanding of current flow paths and connectivity of flow to the valley floor is required to inform future management approaches. Previous management of flow has been partially successful in spreading water over the valley floor by using leaky dams.



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.

Restoration Approach

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

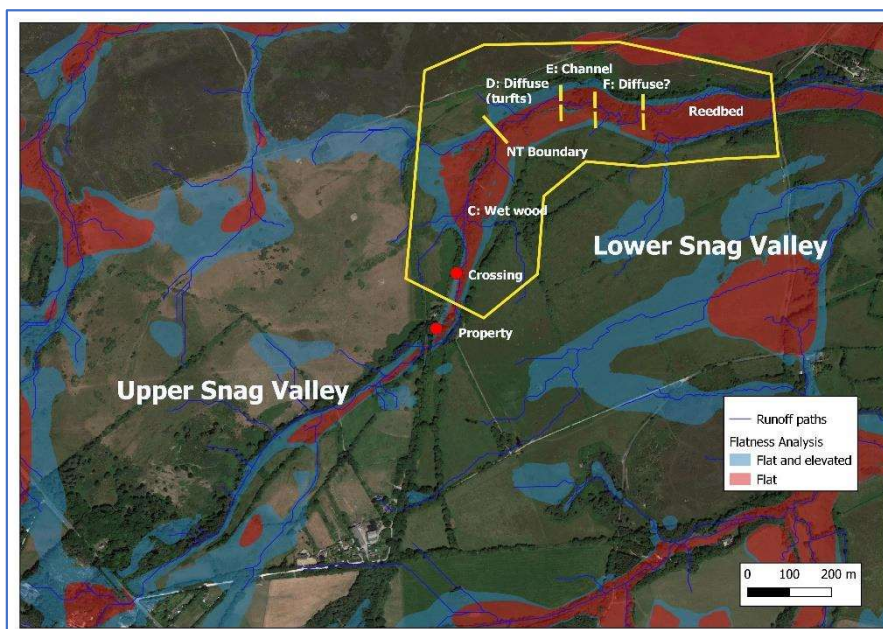
- Maximise supply of a diffuse flow to the flatter areas;
- Retain water on flatter sites for as long as possible;
- Restore modified channels to reduce drainage of water away from sites. Modifications can include incised, embanked, straightened, or realigned planforms;
- Connect flow to adjacent “floodplain”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

Site 5 Lower Snag Valley

Summary of key observations:

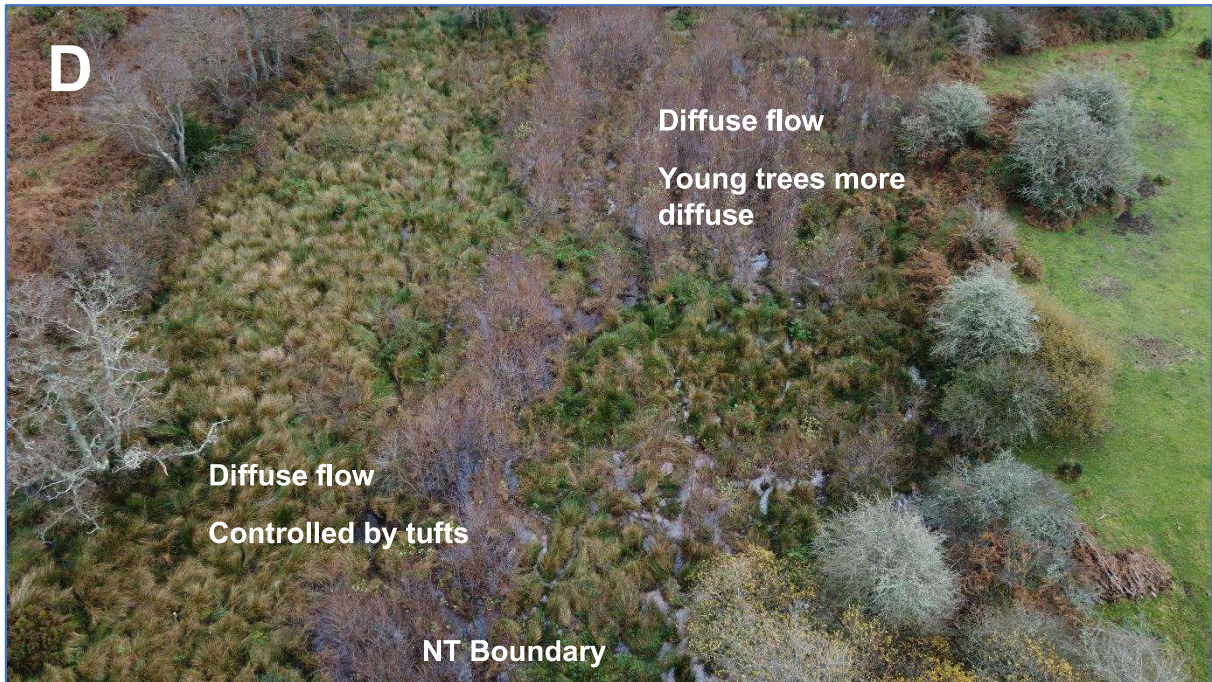
- From the property between Upper and Lower Snag Valley to the boundary of National Trust (NT) land, flow is within a relatively narrow wooded valley floor (reach C);
- Limited observation at a crossing point between the property and the NT boundary noted flow in a single channel connecting with the valley floor, creating wet woodland during the observed post spate condition in November 2023. The single channel may concentrate flow during lower flow conditions and reduce connectivity as levels fall;
- Downstream from the NT boundary, flow during observation in November 2023 was diffuse for a reach of ca. 200m with water spread across approximately 20m width of the valley floor (reach D);
- Floodplain vegetation had an important control on distribution of flow with tufts of grass dictating how water spread laterally; Where young trees limited grass growth, flow was more diffuse;
- From ca. 200m downstream of the NT boundary for a further ca. 100m, a single straight channel ca. 2-3m wide x 0.3-0.5m deep drains the valley floor through an area of mature trees (reach E);
- Secondary channels can be observed in the mature tree reach but flow has been disconnected from the valley floor; and
- A further reach through mature trees for another 100m to the downstream reedbed was not fully investigated but flow pathways appear more diffuse (reach F).

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.

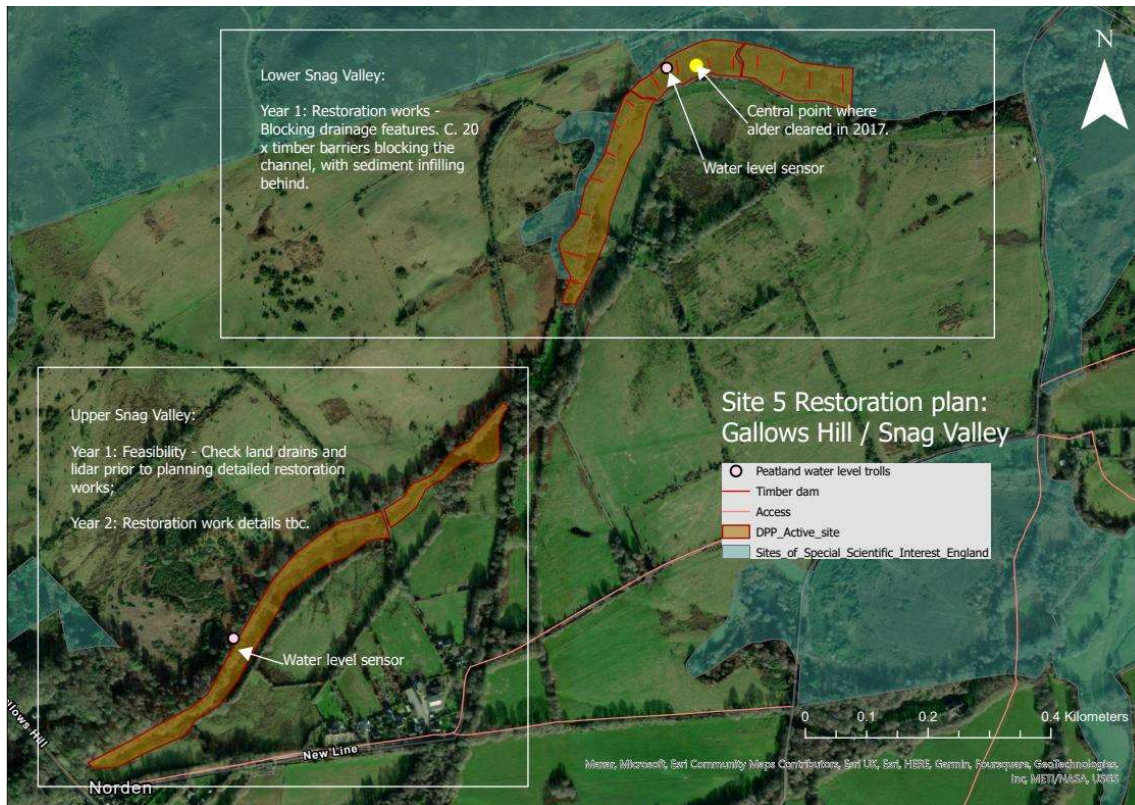


D: reach from NT boundary through grass tufts and young trees

E: reach into mature wood drained by single straight channel

Restoration Options:

Current plans



Potential refinement (ref maps below):

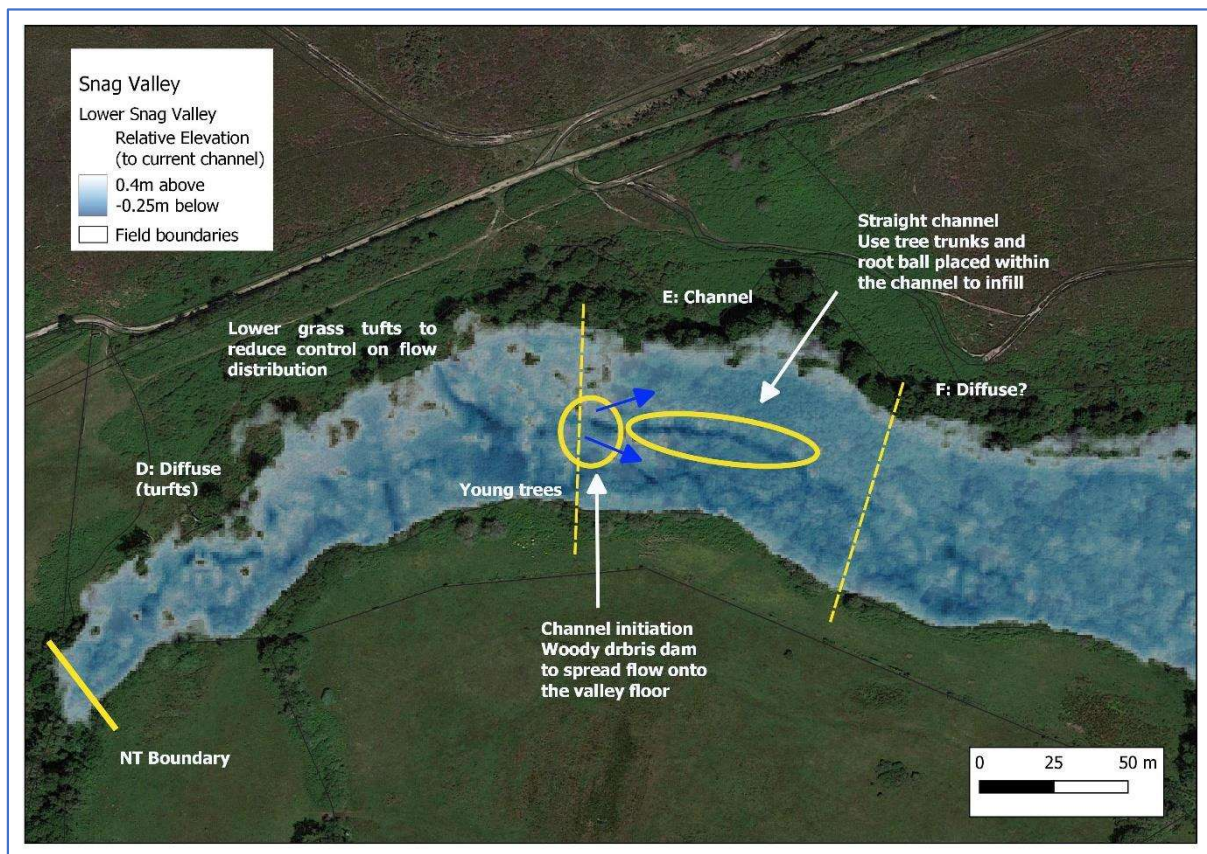
- (improvement of connectivity in wet woodland between property and NT boundary (reach C) by addition of woody debris to the channel);
- Reduce grass tuft impact on flow distribution in the ca200m reach between the NT boundary and the initiation of the straight channel (reach D);
- Distribute flow onto the valley floor at the initiation of the straight channel into the mature woodland (reach E); and
- Infill the straight channel through the mature wooded reach (reach E).

Floodplain Reach E

Previous management of vegetation on the valley floor and installation of woody debris dams in reach D channel has had some success in connecting flows. Currently the impact of grass tufts is influencing the extent of flow distribution.

Woody debris dams have been installed into the former single channel. Dam structures where new channels (avulsion) have evolved onto the adjacent valley floor have been most effective in connecting and creating a diffuse floodplain flow.

Further measures are proposed where flow concentrates to develop into the straight through the mature trees.



Further woody debris dams are proposed at the point where flow becomes concentrated into the straight channel flowing through reach E. There is already some evidence of secondary channels forming in the valley floor but likely only occupied during spate flows when water level is higher. Woody debris dams are proposed at the initiation of the straight channel into the mature wooded (area to be cleared) to initially raise water/bed level and redistribute flow onto the wider valley floor.

At least 3x structures should be considered at 10m spacing, before the channel become sufficiently straight for the measure below. The aim of the structures is to create new pathways of flow onto the valley floor.



At the point where the current straight channel is most central to the drainage of the wider valley floor the existing channel can be infilled and flow encouraged to reconnect on to the floodplain in an unconstrained way.

A proposed management of vegetation within the valley floor includes removal of trees by cutting out the root mass and tree trunk. The straight channel dimensions, and requirement to infill the channel to increase floodplain connectivity of flow, fit well with placement of the removed trees and root ball directly into the channel. The root ball is placed upstream and forms the main blockage of the channel, the trunk then provides further channel infill.

Trees can be placed along the ca. 100m reach of the straight channel and form a continuous infill.

NOTE: Any vehicle movement on the wet valley floor during tree removal needs to take care not to create preferential flow pathways through the micro-topography associated with tracks or wheelings.



Considerations Applicable to All Measures

Health and Safety

Any risk to health and safety associated with the workplace must be assessed in accordance with the Health and Safety at Work etc. Act 1974 and the Management of Health and Safety at Work Regulations 1992

Health and Safety considerations of any intervention measures are fundamental to every scheme, with special consideration to working near or in water.

Construction (Design and Management) Regulations 1994 will apply to:

- Any construction design work, irrespective of how long the construction phase lasts or how many workers are involved on site.
- All demolition work proposed and any construction work that lasts for more than 30 days, or involves more than 500 person days of work must be notified to the local Health and Safety Executive, before commencement, using form F10.
- Non-notifiable construction work which involves five people or more carrying out construction work on any one time.

Permissions and Planning

For the majority of the measures proposed, it is assumed that land owner permission will be required and arranged. Where proposed schemes involve channel re-alignment across the floodplain land use change may need to be considered.

Where changes to land use are proposed such as bunding of field corners to retain runoff, potential conflicts with subsidies and agri-environment schemes will need to be checked.

Measures that are implemented within the Ordinary Watercourse will require Land Drainage Consent from Dorset County Council. It is recommended that Dorset Council or Environment Agency are involved in the development process for any intervention at the earliest possible opportunity. It is not anticipated that planning permission will be required for the proposed measures but this will need to be confirmed in dialogue with the council.

Parts of the catchment are designated sites and any changes on designated land will need to be agreed with Natural England.