

Natural England Commissioned Report NECR141

New Forest SSSI Ecohydrological Survey Overview

Annex N: Sway Mire

First published 06 March 2014

www.naturalengland.org.uk



Contents

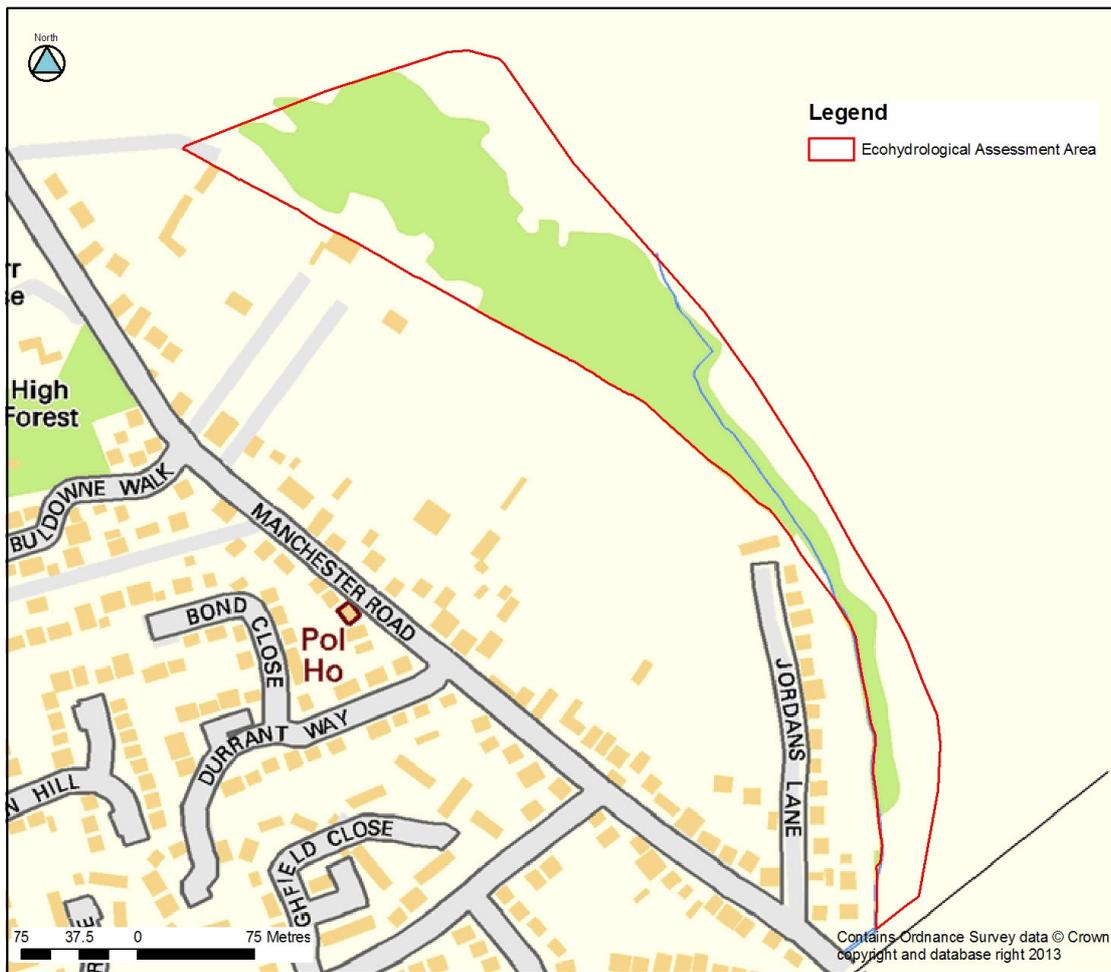
1	Sway Mire	2
1.1	Introduction	2
1.2	Topography and Wetland Distribution	3
1.3	Ecology	5
1.4	Geology and Hydrogeology	5
1.5	Water Supply Mechanisms	6
1.6	Damage and Restoration.....	8
1.7	Monitoring requirements.....	9
2	Maps.....	9

1 Sway Mire

1.1 Introduction

This Ecohydrological Assessment Area (EcoHAA) covers 4.9ha and is contained within SSSI Unit 521 with its centre at National Grid Reference (NGR) 427995, 99243 (see Figure 1-1).

Figure 1-1: Location Map



Sway Mire is contained within a narrow valley. The upper part of the valley is underlain by low permeability clays and in the poorly drained bottom is a wet grassland area supplied by surface water run-off. Further down the valley, the low permeability clays are replaced by an easily eroded sand. A gully occupies the base of the valley in this area.

The river terrace gravels that form the surrounding plateau intersect with the valley sides only in a small area. Water from the river terrace gravels forms a flushed slope wetland in this area.

Table 1-1: Sway Mire Ecohydrological Assessment Area Summary Table

Eco-hydrological Assessment Area		O
Name		Sway Mire
Relative Geomorphology Assessment		
Size (ha)		5.0
SSSI Units		521
Valley Side Wetland	Present	Y
	Wetland Type	Flush Dominated Wetland

	Main Source of water	Seepage from River terrace Gravels at join with Headon Beds (aquitar/aquifer alternating beds)
	Indicative NVC communities	M29, M24, M21a, W4b
	Wetland Types	Mire
	Drainage Damage	N
	Scrub/Tree Encroachment Damage	N
	Poaching and Grazing Pressures Damage	Y
Valley Basin Wetland	Present	Y
	Wetland Type	Flush Dominated Wetland
	Main Source of water	Rainfall run-off from the plateau
	Indicative NVC communities	M29, M24, M21a, W4b
	Wetland Types	Wet grassland
	Drainage	Y
	Scrub/Tree Encroachment Damage	N
	Poaching and Grazing Pressures	N
Additional Comments		Large gully has formed in the lower reaches of this valley - limiting the potential spatial extent of mire. Headwater erosion is an issue

It should be noted that although this is a standalone report, it is strongly reliant upon the background information provided in section 3 of the JBA (2013) Ecohydrology Survey Overview report, which provides general geology, hydrogeology, ecology, wetland mechanisms and restoration information for the New Forest wetlands surveyed. At the end of the report is a series of maps which support the assessment and indicate the spatial distribution of the features described.

1.2 Topography and Wetland Distribution

This small site lies within a narrow valley on the edge of a plateau. In the upper part of the valley, a small drain cuts through an area of wet grassland (see Figure 1-2). Further south this drain forms a gully (see Figure 1-3). The point at which the gully forms is likely to be where the substrate underlying the drain changes from the relatively cohesive Headon Formation to the weaker Becton Sand Formation.

Figure 1-2: Wet Grassland Area with Small Drain in the Foreground (NGR 428020, 099301 looking southwards)



Figure 1-3: Drain at point that it forms a gully (NGR 428018, 099228)



There is one section of valley side mire along a relative steep slope in the south western corner of the site.

Figure 1-4: Valley Side Mire with evidence of animal poaching (NGR 428146, 099077 looking southwards)



1.3 Ecology

The site is a combination of wet grassland, scrub, broad-leaved wet woodland and valley mire habitats. It is clear that the site is heavily grazed by both ponies and cattle (and possibly deer), as much of the SSSI unit is heavily poached.

The site has a stream flowing through it which then runs into a cut drain. The aquatic vegetation consisted of Marsh St. John's-Wort *Hypericum elodes*, Bog Pondweed *Potamogeton polygonifolius* and Floating Sweet-grass *Glyceria fluitans*. The stream channel has eroded extensively since it was cut and the lower reaches of the drain are now steeply incised. The central area of the unit does not contain mire, but wet woodland and wet grassland habitats, with sporadic *Sphagnum* tussocks found in the wet grassland areas.

The northern area of the site is mainly dense scrub consisting of Gorse *Ulex europaeus* with occasional Bracken *Pteridium aquilinum* patches interspersed with Heather *Calluna vulgaris*.

Towards the south of the site, the unit becomes much wetter with Deergrass *Trichophorum germanicum*, Purple Moor-grass *Molinia caerulea*, Bog Myrtle *Myrica gale* and *Sphagnum* mosses becoming increasingly dominant. White Beak-sedge *Rhynchospora alba* is also present in this area. A seepage face is present here, and associated mire habitat as well. The mire habitat is not in favourable condition due to the extensive drainage and poaching by animals on site and this is leading to the erosion and loss of the seepage mire and its associated species (Figure 1-4).

1.4 Geology and Hydrogeology

Table 1-2 shows the geology at Sway Mire. The surrounding plateau is overlain by river terrace gravels, however these only intersect the valley sides in certain places. The upper part of the site and the majority of the valley sides are underlain by the Headon Formation. The lower part of the valley bottom (downstream of where the gulleying begins) is formed from the Becton Sands (the local geology maps show this as undifferentiated from the Chama Sands).

Table 1-2: Geology and Hydrogeology

Age	Group	Formation - member	Description	Thickness	Hydrogeological Role	Water Resources
Quaternary		River terrace deposits	CLAY, SILT, SAND and GRAVEL.		Aquifer / Aquitard - Spring lines may be present at the base of high level river terraces.	
Tertiary (Eocene)	Solent Group	Headon Formation and Headon Hill Formation	Greenish grey shelly CLAY with laminated SAND, SILT and CLAY.	Up to 49 m	Aquifer / Aquitard	Sandy strata may provide yields sufficient for domestic or small agricultural use.
	Barton Group	Becton Sand Formation	Yellow/buff fine- to very fine-grained well sorted SAND.	6 – 70 m	Aquifer The most permeable and reliable aquifer within the Barton Group.	Yields up to 600 m ³ /d in the south; in the north they rarely exceed 200 m ³ /d.
		Becton Bunny Member	Grey/brown shelly CLAY.	0 – 8 m	Aquitard	Little useable groundwater
		Chama Sand Formation	Greenish grey fine- to very fine-grained and rather clayey/silty SAND; slightly glauconitic. Also sandy CLAY.	6 – 15 m	Aquifer	May yield small supplies

Local BGS borehole logs (available at <http://www.bgs.ac.uk/GeolIndex/>) and hand augering on site showed the Headon Formation to be a mixture of gleyed silty clay and sandy clay (so will act as an aquitard), whilst the Becton Sands are a grey loamy sand (so will act as a aquifer). Exposures of the river terrace deposits showed them to be formed mainly of gravels (so will act as an aquifer).

1.5 Water Supply Mechanisms

The two wetlands are flush dominated and appear to have very separate mechanisms. The river terrace gravels intersect the side of the valley in only a few very limited places. Where this occurs, a seepage face forms at the junction between the river terrace gravels and the underlying Headon Formation. Water runs over the low permeability Headon Formation, supporting a wetland community.

The valley bottom wet grassland area situated at the top of the site is within a depression and is underlain by the low permeability Headon Formation deposits. It is supplied by surface run-off channelled along the valley from the plateau. The area is poorly drained so the surface run-off collects in the area.

Figure 1-5: Conceptual Model Diagram of valley side wetland

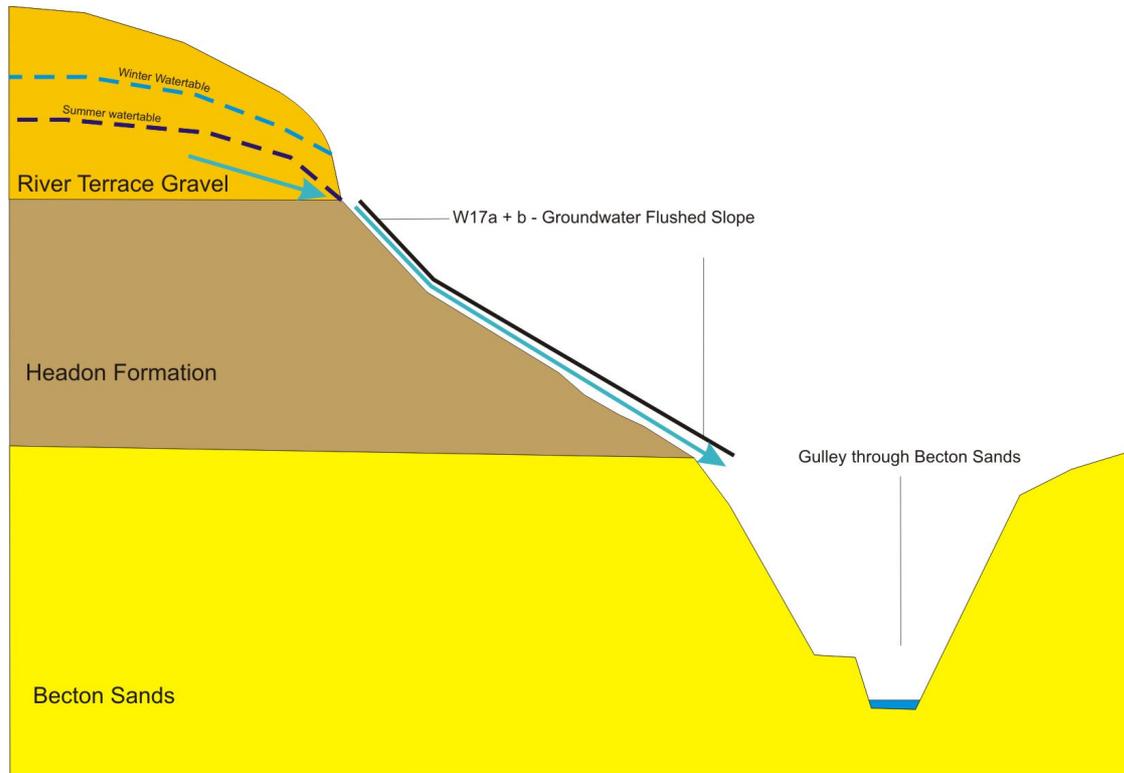
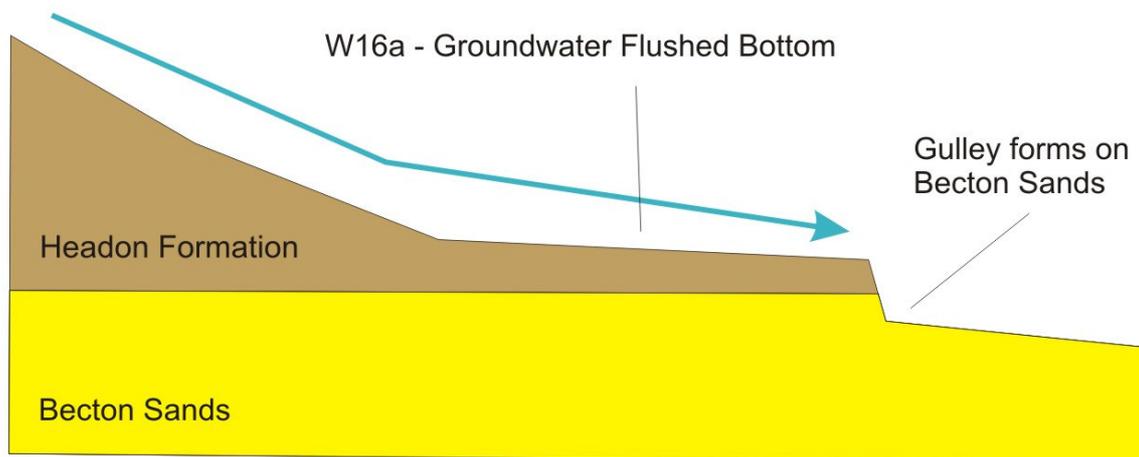


Figure 1-6: Conceptual Model Diagram of valley bottom wetland

Surface Water from plateau channelled into valley



1.5.1 WETMECS identified

WETMECs are ecohydrological classifications of how water can be supplied to a wetland to create distinguishable habitats. WETMECS were developed in partnership between the Wetland Research Group at the University of Sheffield, the Environment Agency, English Nature (now Natural England) and Countryside Council for Wales (now Natural Resources Wales). For each Ecohydrological Assessment Area WETMECS have been identified.

The WETMECS identified include:

Valley side wetlands areas of W17a+b and W17b.

Valley bottom wetland - W16a.

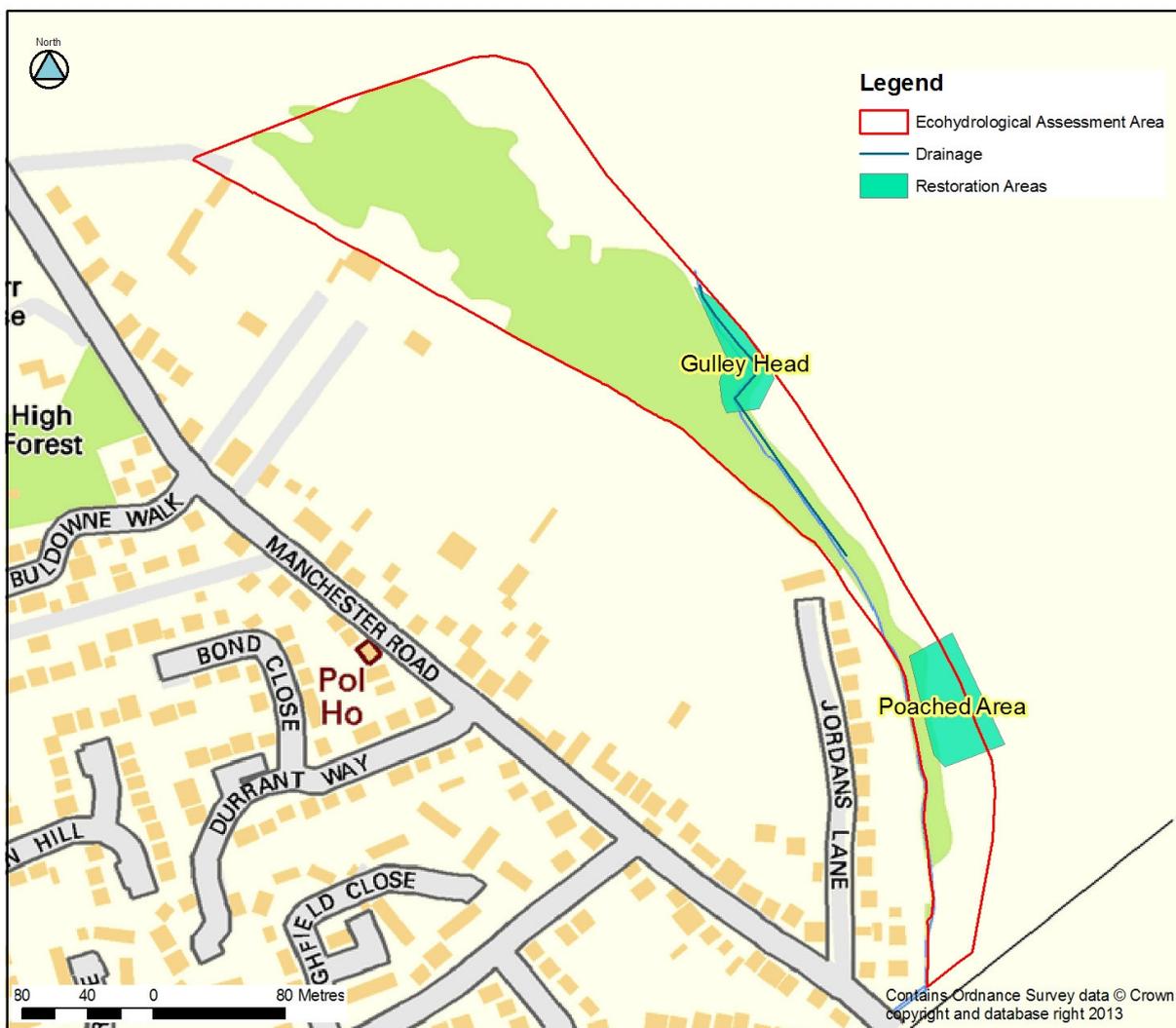
1.6 Damage and Restoration

1.6.1 Damage

There are two areas of slight damage (see Figure 1-7):

- Gulley Head - at the lower end of the valley bottom wetland the gulley is improving drainage. It is unclear whether the gulley is natural or developed from an artificial drain.
- Poached Area - the valley side wetland appears to be subject to significant poaching of the peat soils by animals.

Figure 1-7: Restoration Areas Map



1.6.2 Restoration

The gulleying only begins where the Headon Formation gives way to the Becton Sands. Further headward erosion of the gulley into the Headon Formation may be limited, as it is likely to be more consolidated and less prone to erosion than the Becton Sands. The rate of headward erosion is unclear so monitoring of the gulley head is recommended before any restoration measures are suggested. At a maximum, restoration would consist of a 4-6 small wooden dams, set within the gulley to limit the erosion.

It will be necessary to monitor the poached area and implement a grazing management plan across the site to reduce the pressure upon the more fragile mire habitats.

Table 1-3: Restoration Area Summary Table

Restoration Area	Damage Type	Restoration Proposals	Improvement	Constraints and Issues
Gulley Head	Drainage	Monitoring	Will ensure the extent of wet grassland remains the same and does not deteriorate further.	None
Poached Area	Poached Ground	Grazing management	Prevents sensitive mire habitat becoming trampled and damaged continuously.	Grazing rights may restrict any limitations on the existing grazing regime

1.7 Monitoring requirements

1.7.1 Water Monitoring

The site contains flush dominated wetlands with thin peats or peaty soils - groundwater monitoring is unlikely to be appropriate for such a site. A fixed point camera survey of the gulley would help to elucidate the rate of headward erosion at the gulley head.

1.7.2 Vegetation

Poaching across the site can be monitored by taking fixed point camera surveys of specific areas within the site on a bi-annual basis. Quadrats may also be used to monitor vegetation recovery within the managed grazing areas.

Table 1-4: Monitoring Requirements

Eco-hydrological Assessment Area	SSSI Units	Site Names	Requirements for monitoring: ecology	Requirements for monitoring: hydrology (number of installations estimated)
O	521	Sway Mire	Fixed point camera survey (specifically focussing on areas of poaching) Fixed point quadrat survey (to monitor extent and quality of wet grassland areas and recovery of previously poached areas)	Flush dominated wetland – fixed point camera survey of the gulley head

2 Maps

Map 1: Location

Map 2: Aerial Photography

Map 3: Topography, Hydrology and Wetland Distribution

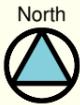
Map 4: Phase One Habitat

Map 5: Drift Geology

Map 6: Bedrock Geology

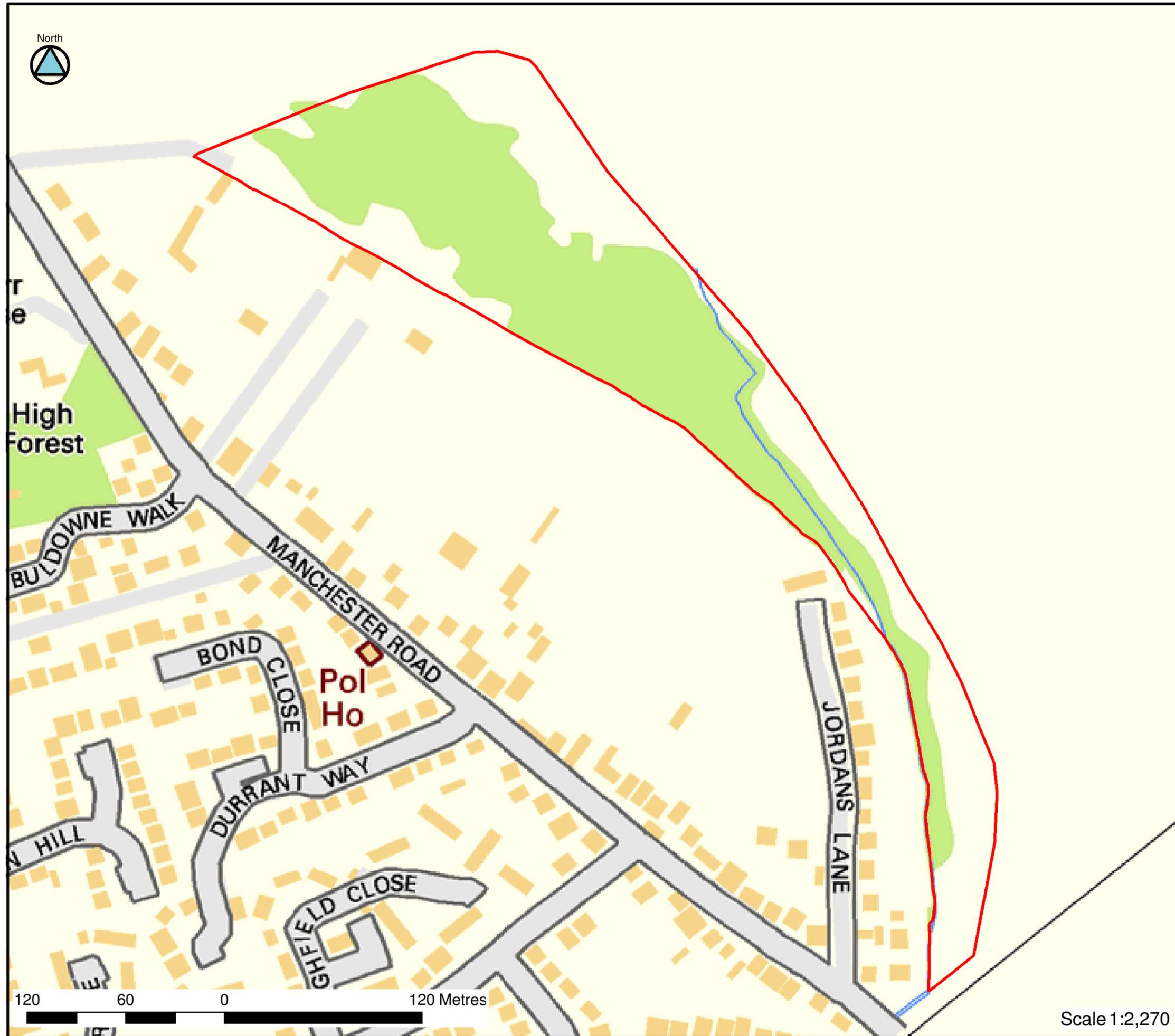
Map 7: Eco-Hydrology Map

Map 8: Restoration Plan



LEGEND

 Ecohydrological Assessment Area



Contains Ordnance Survey data © Crown copyright and database right 2013.



Scale 1:2,270

MAP 1

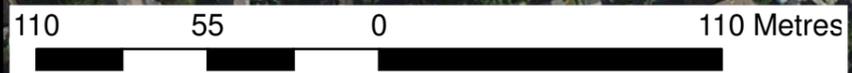
Site Location



LEGEND

 Ecohydrological Assessment Area

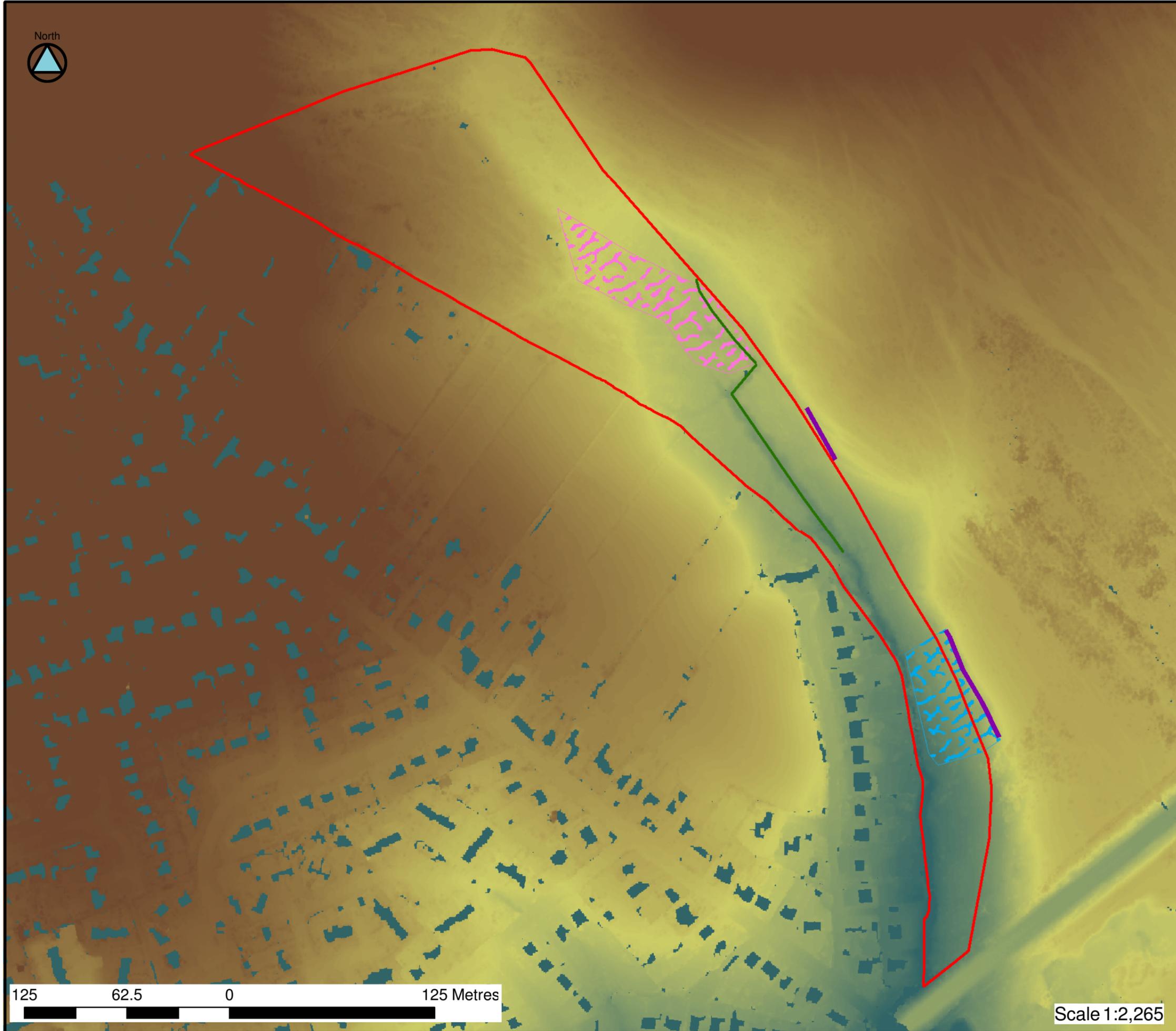
© 2013 Microsoft Corporation and its data suppliers



Scale 1:2,270

MAP 2

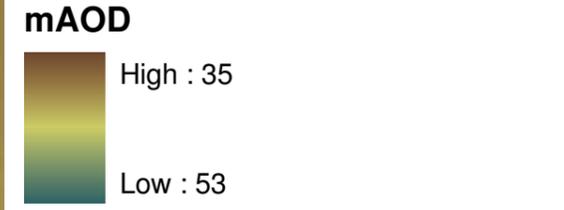
Aerial Photography



LEGEND

- Ecohydrological Assessment Area
- Seepage face
- Drainage
- Valley Bottom Wetland
- Valley Side Wetland

LIDAR



© Forest Research based on Cambridge University Technical Services and New Forest NPA data.



MAP 3

Topography, Hydrology and Wetland Distribution



Scale 1:2,265



LEGEND

-  Ecohydrological Assessment Area
-  M G2.2
-  A1.1.1
-  A2.1
-  B5
-  B6
-  C1.1
-  E3.1
-  G1.1
-  G2.2

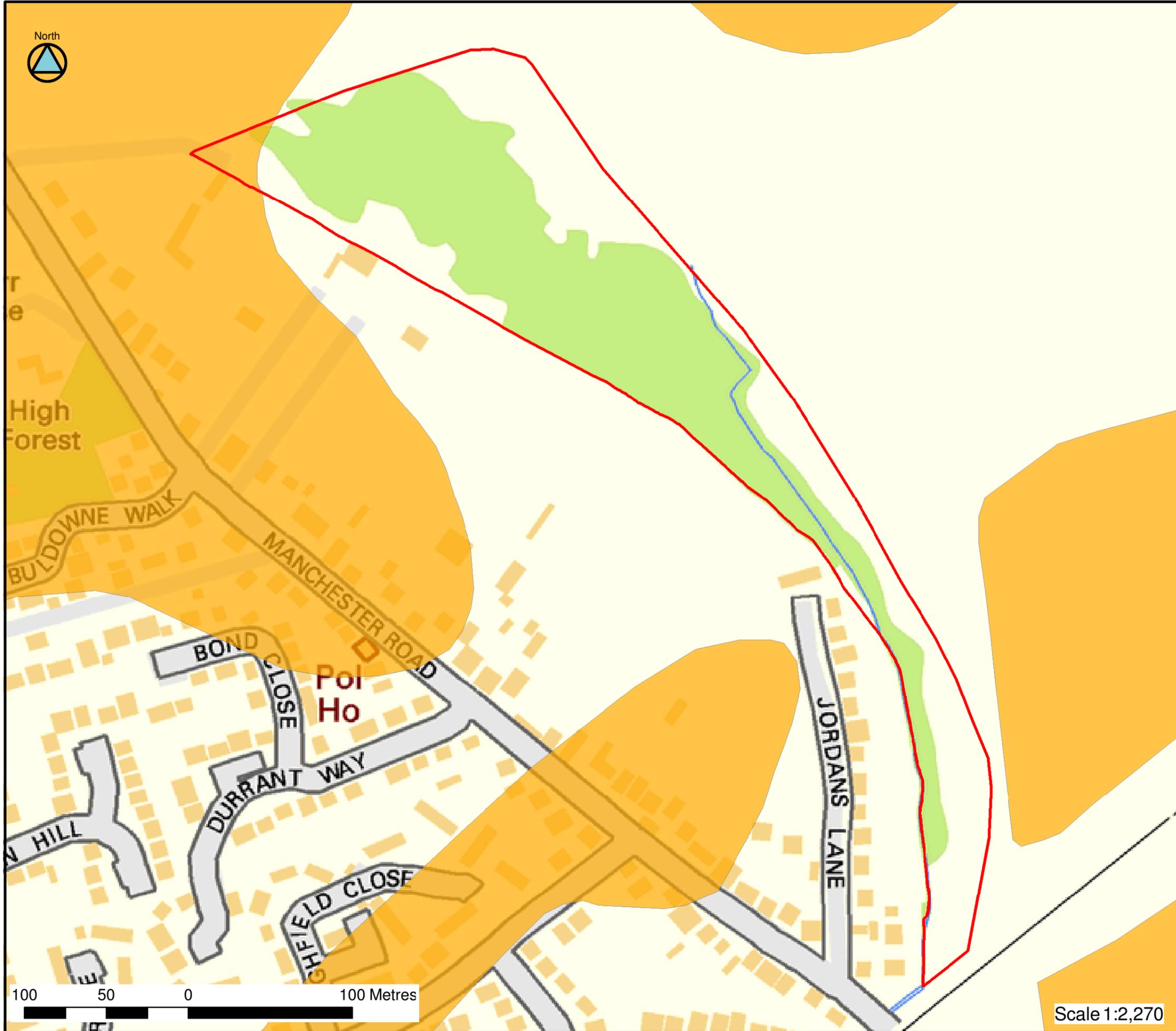
Contains Ordnance Survey data © Crown copyright and database right 2013.



MAP 4

Phase One Habitat

Scale 1:2,100



LEGEND

- Ecohydrological Assessment Area
- No Drift
- Other Deposits
- Alluvium - Clay, Silt, Sand and Gravel
- Head - Clay, Silt, Sand and Gravel
- Head - Gravel, Sand, Silt and Clay
- Head - Silty Clay
- Head - Gravelly Sand
- Peat
- River Terrace Deposits - Clay and Silt
- River Terrace Deposits - Sand and Gravel
- River Terrace Deposits - Sand, Silt and Clay

Contains Ordnance Survey data © Crown copyright and database right 2013. Natural England Licence No. 2011/052
 British Geological Survey © NERC. All rights reserved



MAP 5
 Drift Geology

Scale 1:2,270



LEGEND

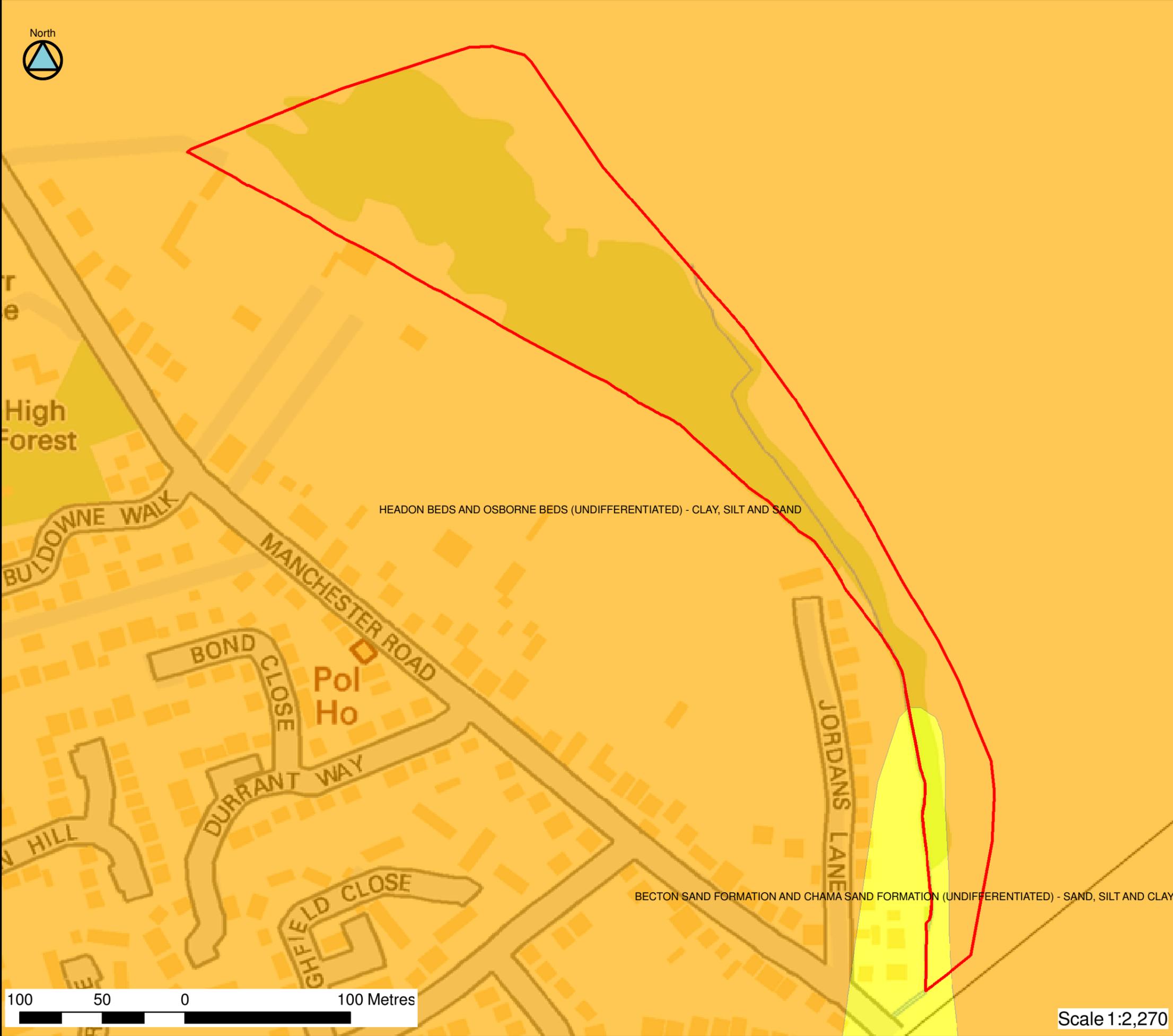
- Ecohydrological Assessment Area
- Other Rock Types
- Headon and Osbourne Beds
- Clay, Silt and Sand
- Headon Formation
- Clay, Silt and Sand
- Lyndhurst Member
- Sand, Silt and Clay
- Becton Sand Formation
- Sand
- Becton and Chama Sand Formation
- Sand, Silt and Clay
- Becton Bunny Member
- Clay
- Chama Sand Formation
- Sand
- Chama Sand Formation
- Sand, Silt and Clay
- Chama Sand Formation
- Silty Clay
- Barton Clay Formation
- Clay
- Barton Clay Formation
- Sand
- Selsey Sand Formation
- Sand, Silt and Clay
- Marsh Farm Formation
- Clay, Silt and Sand
- Poole Formation
- Sand, Silt and Clay
- London Clay Formation
- Clay, Silt and Sand

Contains Ordnance Survey data © Crown copyright and database right 2013. Natural England Licence No. 2011/052
British Geological Survey © NERC. All rights reserved

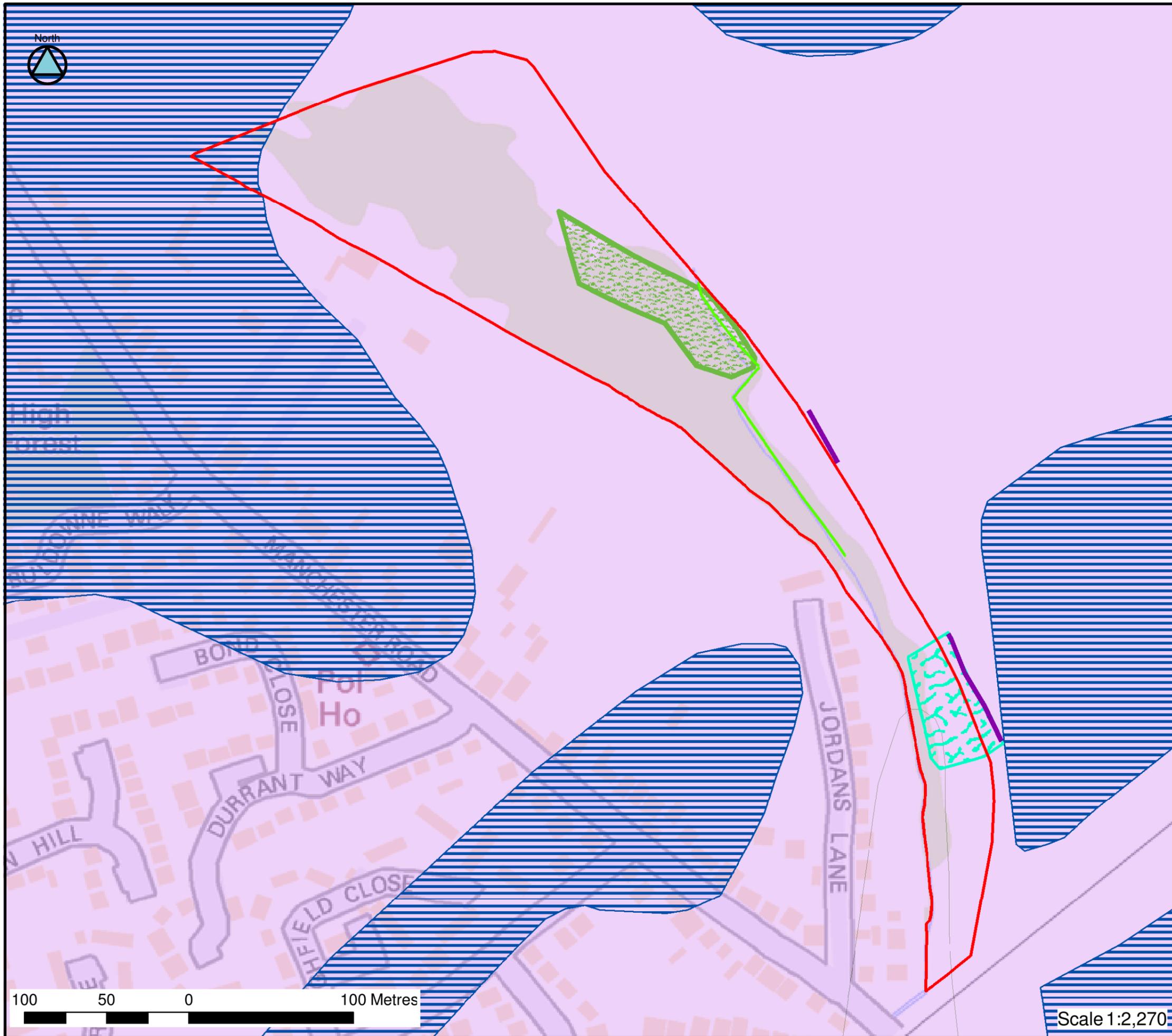


MAP 6

Bedrock Geology



Scale 1:2,270



LEGEND

- Ecohydrological Assessment Area
- Seepage face
- Drainage
- Valley Bottom Wetland
- Valley Side Wetland
- Drift Hydrogeology**
- Aquifer
- Aquifer/Aquitard
- Aquitard
- Bedrock Hydrogeology**
- Aquifer
- Aquifer/Aquitard
- Aquitard

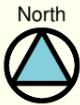
Contains Ordnance Survey data © Crown copyright and database right 2013. Natural England Licence No. 2011/052
British Geological Survey © NERC. All rights reserved



Scale 1:2,270

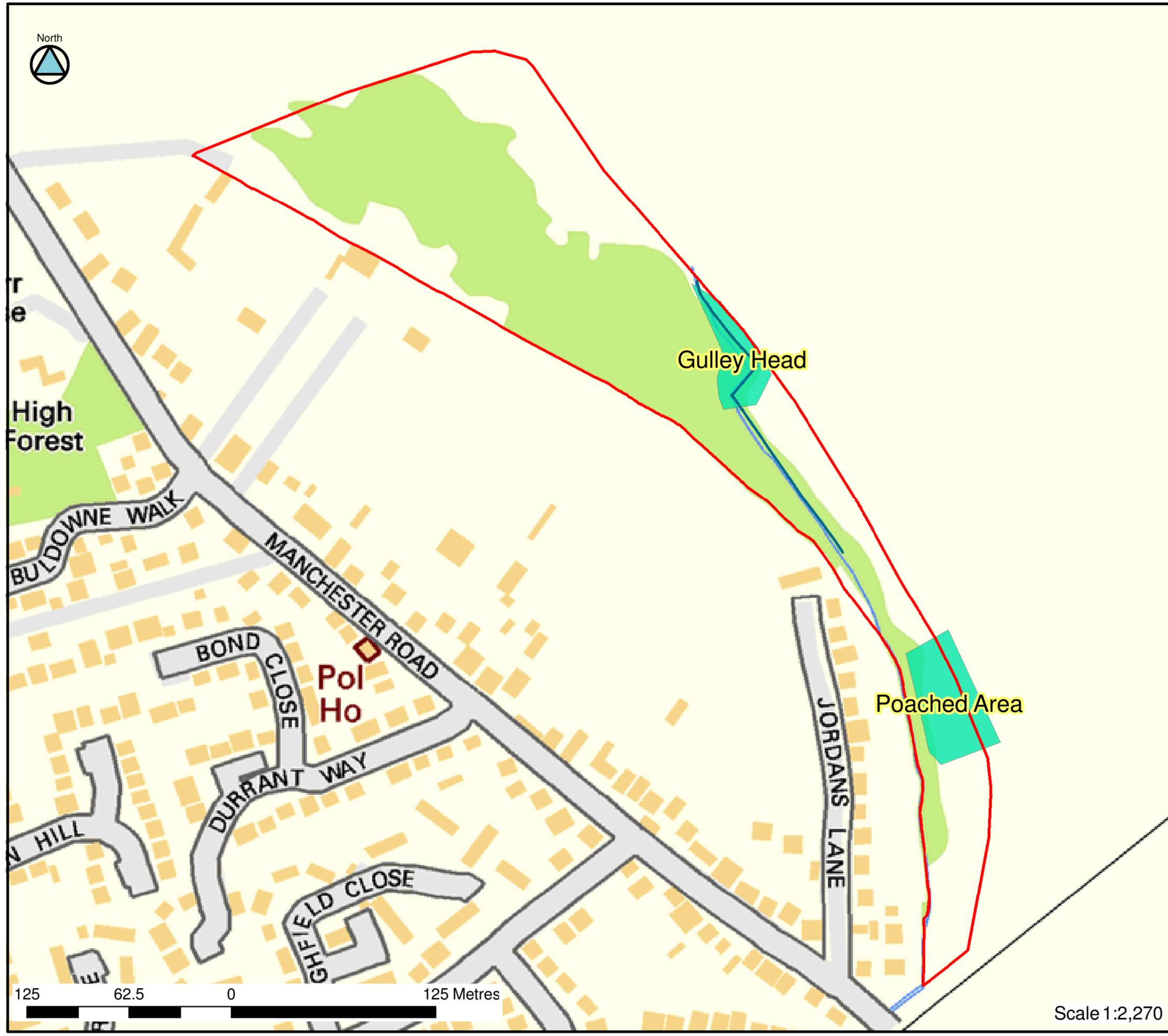
MAP 7

Eco-hydrology



LEGEND

-  Ecohydrological Assessment Area
-  Drainage
-  Restoration Areas



Contains Ordnance Survey data © Crown copyright and database right 2013.



MAP 8

Restoration Plan

Scale 1:2,270