

Natural England Commissioned Report NECR141

New Forest SSSI Ecohydrological Survey Overview

Annex P: Longdown Mire

First published 06 March 2014

www.naturalengland.org.uk



Contents

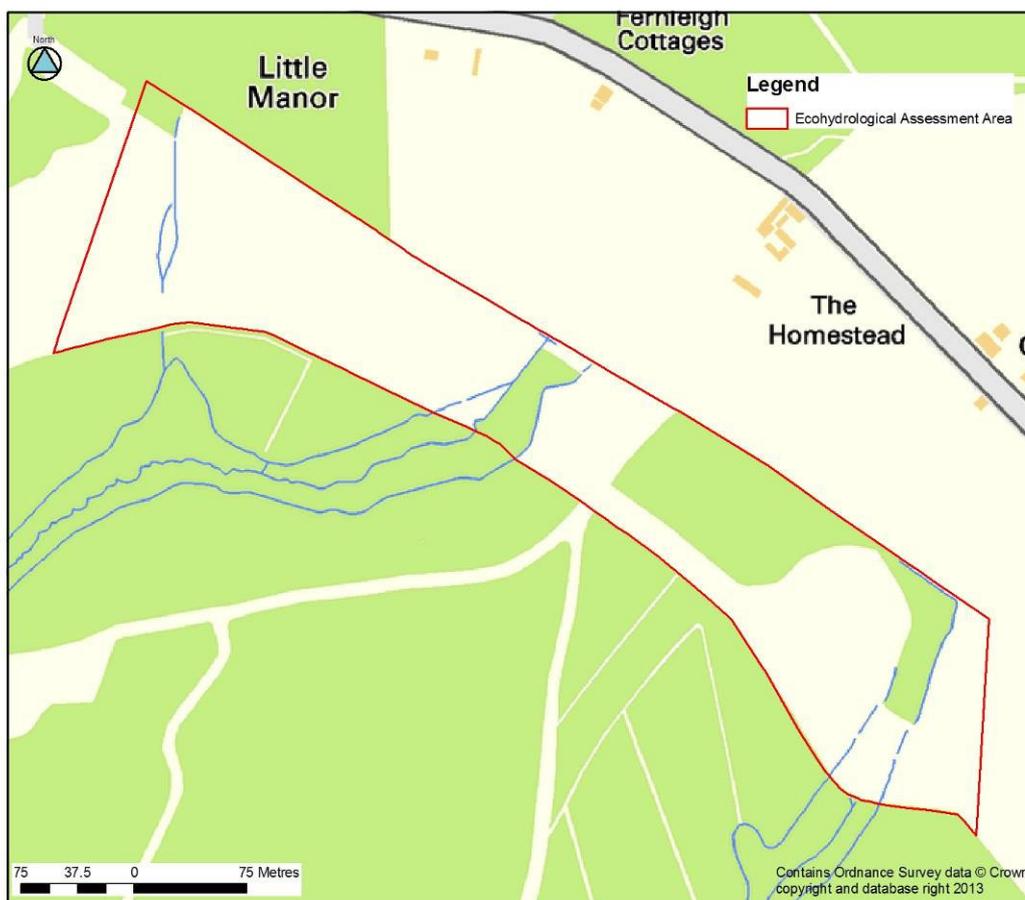
1	Longdown Mire	2
1.1	Introduction	2
1.2	Topography and Wetland Distribution	3
1.3	Ecology	5
1.4	Geology and Hydrogeology	6
1.5	Water Supply Mechanisms	7
1.6	Damage and Restoration.....	9
1.7	Monitoring requirements.....	12
2	Maps.....	13

1 Longdown Mire

1.1 Introduction

This Ecohydrological Assessment Area (EcoHAA) covers 7.4ha and is contained within SSSI Unit 413 with its centre at National Grid Reference (NGR) 435649, 109239 (see Figure 1-1).

Figure 1-1: Location Map



This series of flush dominated wetlands occupy the heads of two adjoining valleys. Within the base of the valleys are three areas of valley bottom wetlands, two of which are damaged by drainage and scrub encroachment. It appears that these wetlands would have (and to an extent still do) continued downstream of the site.

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

Eco-hydrological Assessment Area		Q
Name		Longdown Mire
Relative Geomorphology Assessment		
Size (ha)		7.4
SSSI Units		413
Valley Side Wetland	Present	Y
	Wetland Type	Flush Dominated Wetland / Seepage Dominated Wetland
	Main Source of water	Majority of water from seepage from Becton sands
	Indicative NVC communities	M24, M21a,

	Wetland Types	Mire/ wet heath
	Drainage Damage	Y (drains forming collects, path drainage intercepting seepage) (Moderate)
	Scrub/Tree Encroachment Damage	Y (seedlings from bounding areas of forestry)
	Poaching and Grazing Pressures Damage	Y
Valley Basin Wetland	Present	Y
	Wetland Type	Flush Dominated Wetland
	Main Source of water	Seepage from Becton sands (lower slopes and valley base underlain by Chama Sands (aquitarad))
	Indicative NVC communities	M24, M21a,
	Wetland Types	Mire/ wet heath
	Drainage	Y (historic drainage along bottom of mires)
	Scrub/Tree Encroachment Damage	Y (scrub along drains)
	Poaching and Grazing Pressures	Y (Minor)
Additional Comments		Three separate valley mires. The valley mires would have continued to the south but forestry has destroyed these habitats. Recent felling could be an opportunity for whole mire system restoration. Rhododendron and Pine encroachment

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

The site occupies the head of two valleys separate by a narrow ridge. Within the western valley are two small valley bottom wetlands and in the eastern valley there is one. Drainage has impacted all three within scrub colonising two of them (Figure 1-2).

Figure 1-2: Track leading down to line of scrub formed along the valley bottom wetland due to drain (NGR 435790, 109105)



Surrounding the valley bottom wetlands are flush dominated valley side wetlands (supply mechanism discussed below) (see Figure 1-3). Some very small drains occur on parts of these areas but do not seem particularly effective. In the eastern part of the western valley, the footpath that runs along the top of the site drops to a lower elevation. Here it intercepts flush waters and focuses it into culverts. The valley side wetland below this point is damaged as water is focused into narrow bands, rather than across the whole surface (see Figure 1-4).

Figure 1-3: Western valley side wetland with small drain in foreground (NGR 425455, 109435)



Figure 1-4: Track along the top of the western valley side wetland intercepting and channelling flush waters through culverts (NGR 435585, 109305)



Downhill of the site in both valleys, open ground is replaced by forestry and felled forestry. The planting of conifers and the drainage associated with them has removed any wetland from these areas which would have continued on from the site (see Figure 1-5).

Figure 1-5: Abrupt change to an area of felled forestry in the eastern valley (NGR 435820, 109030)



1.3 Ecology

Within Unit 413 there are several small areas of mire habitat. Towards the west of the site is a seepage face which has resulted in valley mire habitat forming. However, this area of mire is not in favourable condition and immature Scot's Pine *Pinus sylvestris* encroachment suggests that the area is drying out. This is contributed to further by the presence of a drain which has been cut across this section of mire. As the Unit continues towards the west, it becomes a mosaic of wet grassland with areas of both broad-leaved and coniferous woodland.

The middle of the site (near the footbridge) is extremely wet and contains wet woodland and grassland, the majority of which is severely poached. The area seems to be in a transitional phase with *Sphagnum spp.* present along with other mire indicators. However, the most prevalent species are those found in grassland habitats such as Fescues *Festuca spp.*

Across the centre of the Unit runs a track from Longdown Inclosure. On the eastern side of the track is an area of felled woodland. This area is in transition and contains a mixture of species consistent with wet grassland/wet heath habitat including, Cross-leaved Heather *Erica tetralix*, Star Moss *Tortula ruralis*, Deergrass *Trichophorum germanicum*, Heather *Calluna vulgaris*, interspersed with *Sphagnum spp.* and patches of Soft Rush *Juncus effusus* and Purple Moor-grass *Molinia caerulea*. More ruderal species associated with disturbed/drier conditions were also present including Bramble *Rubus fruticosus*, Bracken *Pteridium aquilinum* and Scot's Pine *Pinus sylvestris* seedlings.

Further east is another area of felled woodland which extends beyond the Unit boundary (Figure 1-6). This area again, is a mixture of both drier and slightly damper habitats with multiple large drains cut through the centre of it.

The furthest south eastern end of the Unit is cut off by a treeline of Birch *Betula spp.* and Willow *Salix spp.* A seepage face is present to north of this area but a drain has been cut across the top (northern) boundary of the site and further down. As a result the site is wet, but could be wetter to increase the overall mire habitat. Again, this area is in unfavourable condition and is more a marshy grassland 'lawn' that has been heavily grazed.

The north of the site (just outside the boundary) is dominated by Rhododendron *Rhododendron ponticum* with a few seedlings beginning to infringe on the Unit itself (Figure 1-7 below).

Figure 1-6: Area of felled woodland far south-east boundary (NGR 435805, 109000)



Figure 1-7: Rhododendron stands along northern boundary (NGR 435480, 109395)



1.4 Geology and Hydrogeology

Table 1-2 shows the geology at Longdown Mire. River Terrace gravels occur on top of the hills (likely to be relatively permeable and to act as an aquifer), overlying the Becton Sand Formation (likely to be relatively permeable and to act as an aquifer) and lower down the slope the Chama Sand Formation (likely to act locally as an aquitard).

Given the elevation at which the valley side wetlands form, it appears likely that the seepage face occurs at the junction of the Becton Sands and Chama Sands Formation. It does not appear as strong a seepage face as seen on other New forest wetlands, possibly as a result of the relatively small difference in permeability between the Becton Sands and the Chama Sands.

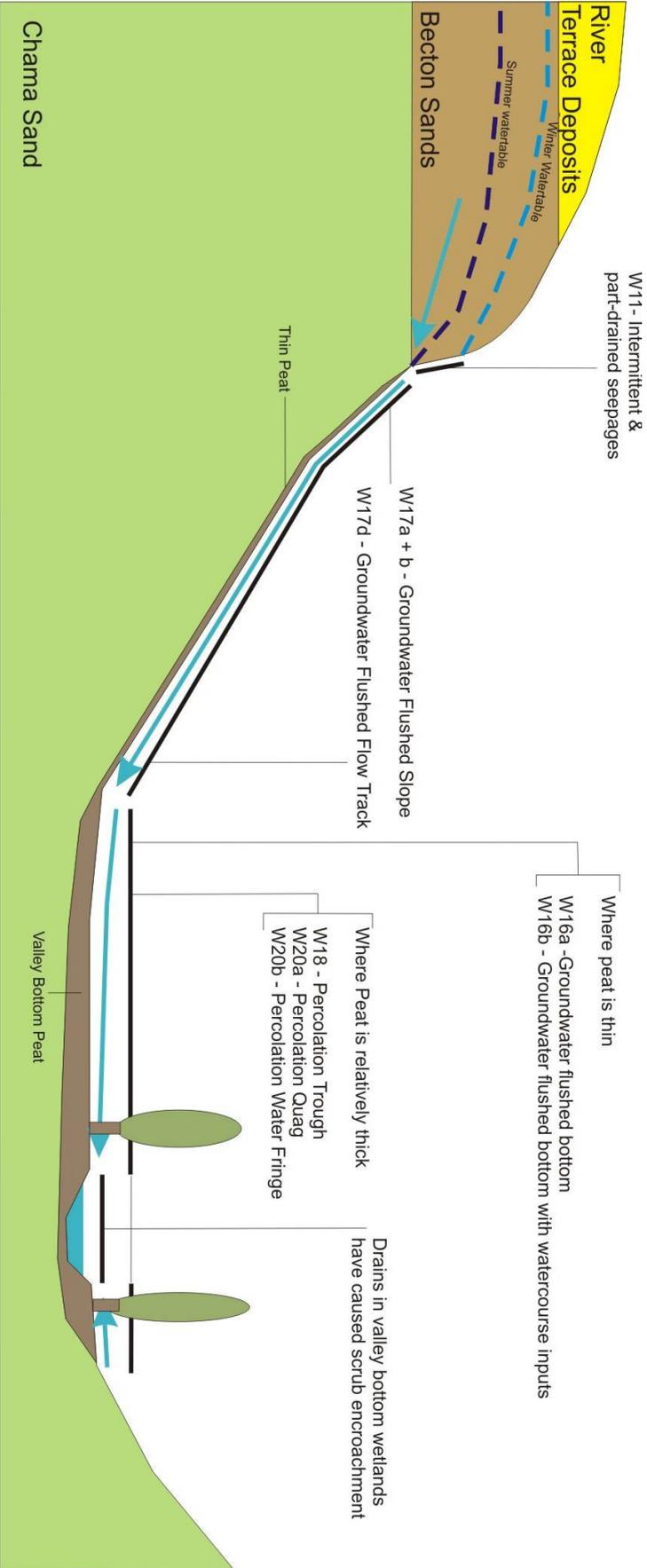
Table 1-2: Geology and Hydrogeology

	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)	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.
	Barton Group	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

1.5 Water Supply Mechanisms

The wetlands on site are flush dominated (see Figure 1-8). They receive water from a weak seepage face at the junction between the Becton Sands (aquifer) and the underlying Chama Sands (aquitard). The water runs over the surface of the low permeability Chama Sands Formation, forming flushed slopes before reaching the shallow valley bottoms.

Figure 1-8: Conceptual Model Diagram



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.

WETMECS identified include:

Valley side wetlands - narrow areas of W17a+b and W17b with small areas of W11 above.

Valley bottom wetlands where peat is thin (most western) - W16a

Valley bottom wetland where peat is thicker - W18 and W20a (some area of the eastern valley bottom appear to be quag where scrub has not taken).

1.6 Damage and Restoration

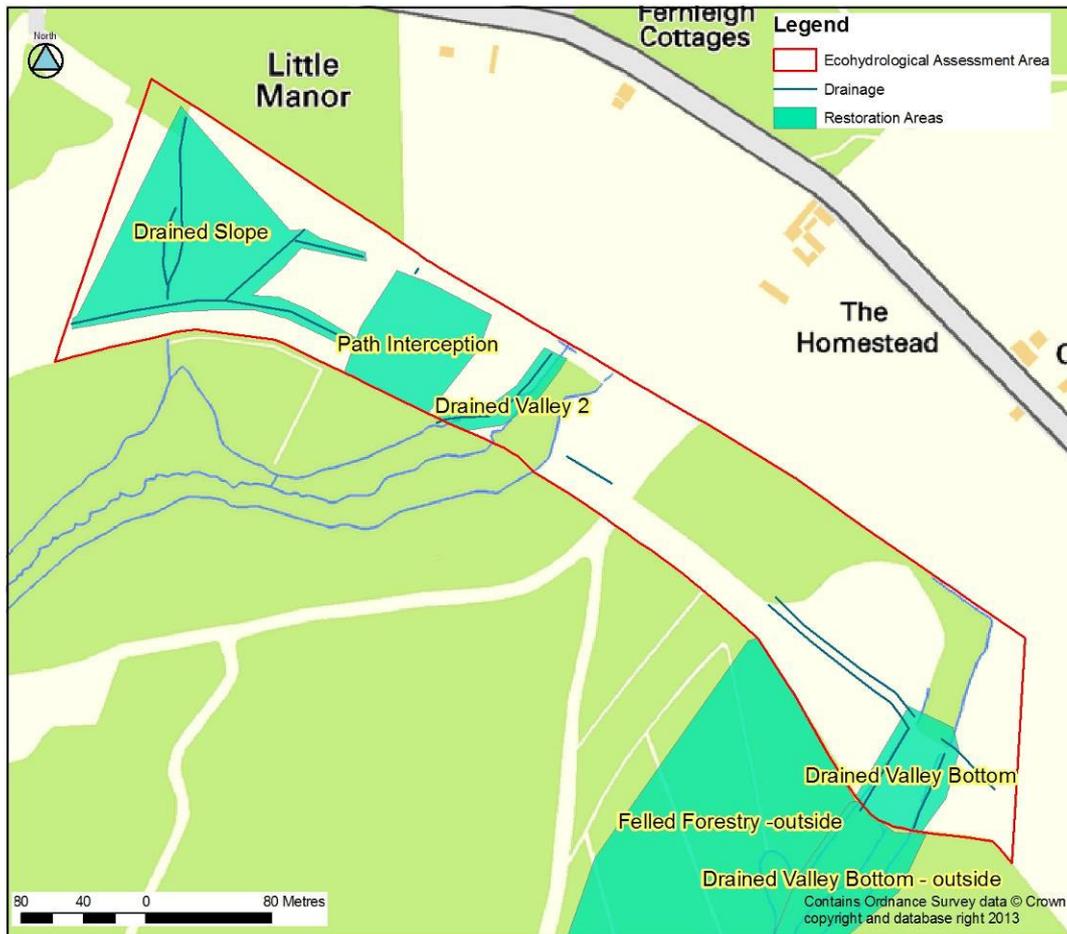
1.6.1 Damage

There are 4 areas of damage within the unit and two areas just outside the unit boundary which will also be discussed (see Figure 1-9):

- Drained Slope - in this area there are a small number of drains on the valley side wetland. These are intercepting flush water to an extent and so drying out areas of the flushed slope;
- Path Interception - in this area the path that runs the length of the site is intercepting flush water channelling into culvert. The ground surface below the path therefore does not have water spread over its whole surface;
- Drain Valley Bottom - in this area some choked drains have led to the replacement of a mire area with scrub. This area continues outside the survey area boundary along the valley to the south;
- Drained Valley 2 - in this area a single drain has led to the replacement of a valley bottom mire with scrub.

An area of recently felled plantation occurs to the south of the eastern valley. This might provide an opportunity for restoration work in this area.

Figure 1-9: Restoration Areas Map



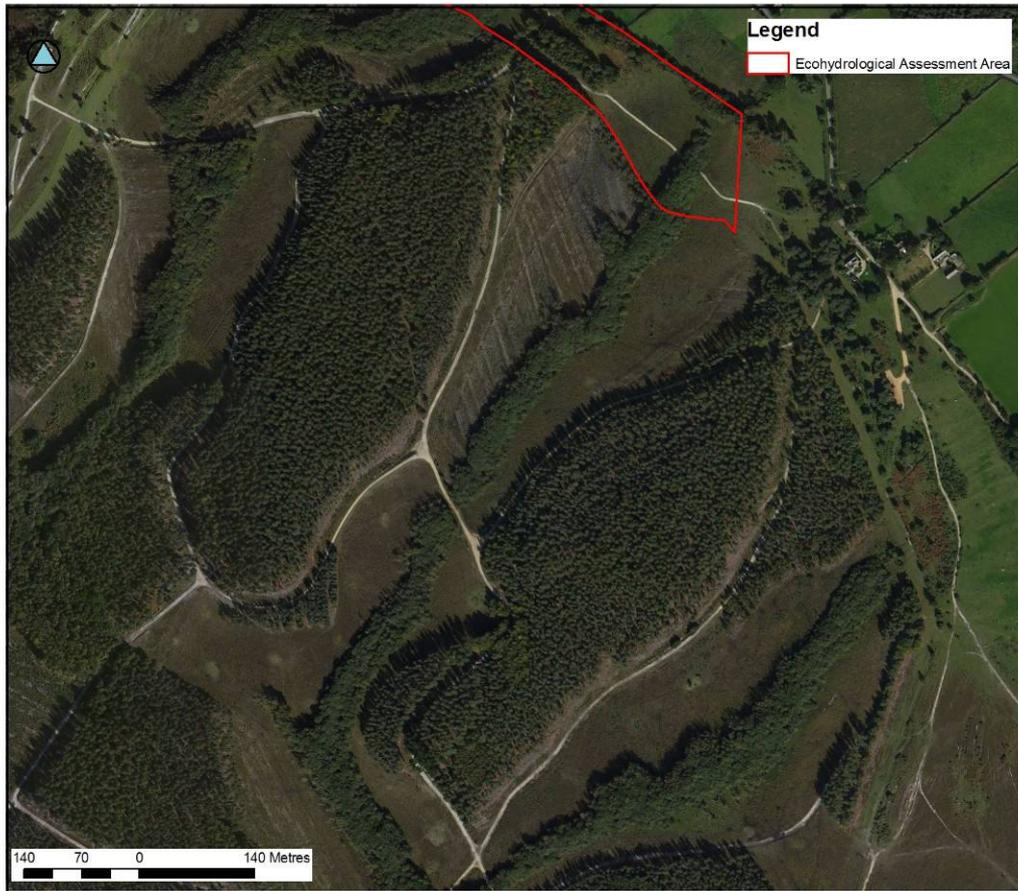
Scrub encroachment of Scot's Pine seedlings and Rhododendron was recorded across the Unit. The extent of Rhododendron encroachment within the Unit itself was relatively minor. However, there are extensive stands located on the northern boundary of the Unit, which do pose a significant threat as it is more than likely they will begin to colonise the Unit at some point, particularly with the current drier conditions as a result of the drainage issues. The northern boundary should be monitored in the future with regard to Rhododendron encroachment.

The cut drain through the west of the site is compromising the mire habitat (which surrounds it) and as a result the immediate area is becoming drier, resulting in wet heath-grassland mosaic habitats forming instead, which are likely to become increasingly drier and scrubbed over without intervention. This is already apparent in the form of pine encroachment which is widespread across the site. Poaching is also an issue on this site as it has been heavily grazed by both cattle and ponies.

1.6.2 Restoration

Restoration works in the valley bottom areas should be developed in concert with plans for areas downstream of the site. There may be only small value in blocking drainage in the upper parts of these valley bottom mires without continuing the work further downhill. This is most true for the eastern valley bottom wetland where, from aerial photography, a scrub covered drained mire appears to continue for at least 1km downhill of the site (see Figure 1-10). As a result, no restoration plans for the valley bottom wetlands are presented here as further survey work is required.

Figure 1-10: Scrub Dominated Valley Bottom Wetland downhill of the Eastern Valley of the Site



© 2012 Microsoft Corporation and its data suppliers

Restoration measures suggested for the valley side wetlands:

- Drained slopes - where effective these drains should be blocked with earth plugs or infilled;
- Path Interception - as the line of the path is at the top of the site along this section, it appears impossible to move the path above the seepage face. The path however could be replaced with a path of more permeable material which would allow the flush water to pass through it, from north to south. This material would ideally be formed of imported uncompacted granular material such as a DTp type 1 hardcore;
- Scrub clearance - particularly of the pine that is encroaching into several areas across the site. Control of Rhododendron stands (or at least monitoring of them) should be a priority to prevent further encroachment into mire and wetland areas;
- Grazing control - there are poaching issues particularly associated with the wetter areas of the site which are most prone to damage.

Table 1-3: Restoration Area Summary Table

Restoration Area	Damage Type	Restoration Proposals	Improvement	Constraints and Issues
Drained Slope	Valley Side Drainage	Infilling or plugging the effective drains	Improvement in water supply to parts of the flush slope Increase in quality and extent of adjacent mire and wet heath	Negligible

Restoration Area	Damage Type	Restoration Proposals	Improvement	Constraints and Issues
			habitats	
Path Interception	Valley Side Drainage	Replacement of the path with a new path made of more permeable material	Improvement in water supply to parts of the flush slope Increase in quality and extent of adjacent mire and wet heath habitats	The footpath may need to be closed during part of the works.
Longdown Mire	Scrub/pine encroachment	Eradication of Pine seedlings and other scrub Monitor Rhododendron along northern boundary	Removal of all non-native invasive species	Possible requirement for on-going management
Drained Slope and Unit middle	Poached Ground	Grazing management	Prevents sensitive mire habitat becoming trampled and damaged continuously	May be constrained by current grazing rights

1.7 Monitoring requirements

1.7.1 Water Monitoring

The site contains flush dominated wetlands - groundwater monitoring is unlikely to be appropriate for such a site. The only exception is potential monitoring of the eastern valley bottom wetland, however, before any monitoring is recommended, the continuation of the wetland to the south, outside the site boundary, should be surveyed.

1.7.2 Vegetation

Pine encroachment has been identified as an issue at this site. As a result, it may be necessary to monitor the extent of encroachment annually post restoration works. Rhododendron monitoring is necessary to ensure that the species does not spread further across the unit, compromising the restoration of the unit as a whole. Monitoring for both invasive species would consist of fixed point camera surveys to assess the extent of the species across the unit; this could be used to monitor continued encroachment without restoration and also the success of any eradication programme implemented. A transect survey method could also be employed to quantify the extent of Rhododendron invasion.

Poaching across the unit can also be monitored by taking fixed point camera surveys of specific areas within the unit on a bi-annual basis. Quadrat surveys 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)
Q	413	Longdown Mire	Fixed point camera survey (specifically focussing on extent of pine and Rhododendron scrub encroachment and areas of poaching) Fixed point quadrat survey (focussing on the recovery of poached areas)	Flush dominated wetland – no monitoring recommended

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.

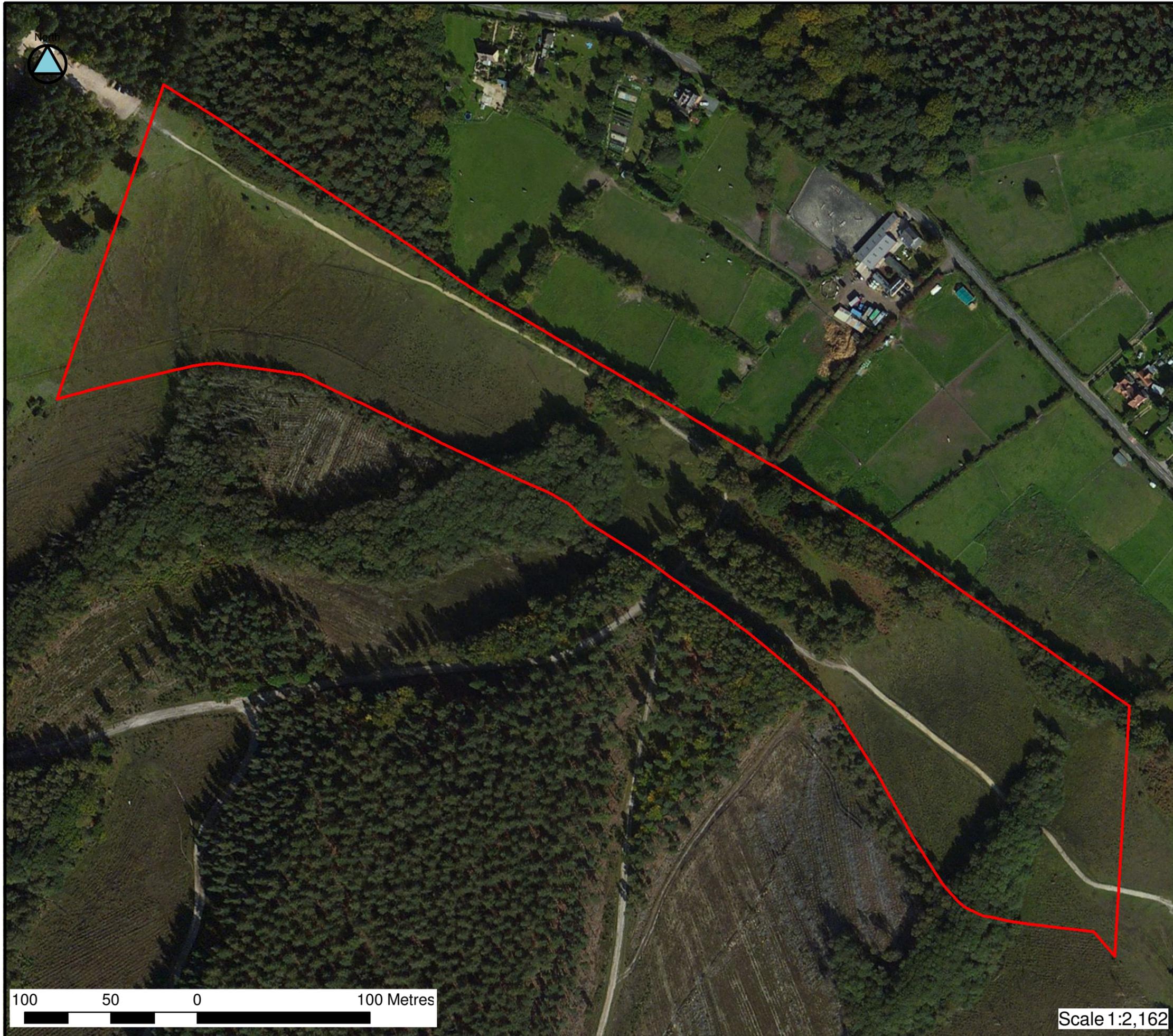


MAP 1

Site Location



Scale 1:2,162



LEGEND

 Ecohydrological Assessment Area

© 2013 Microsoft Corporation and its data suppliers

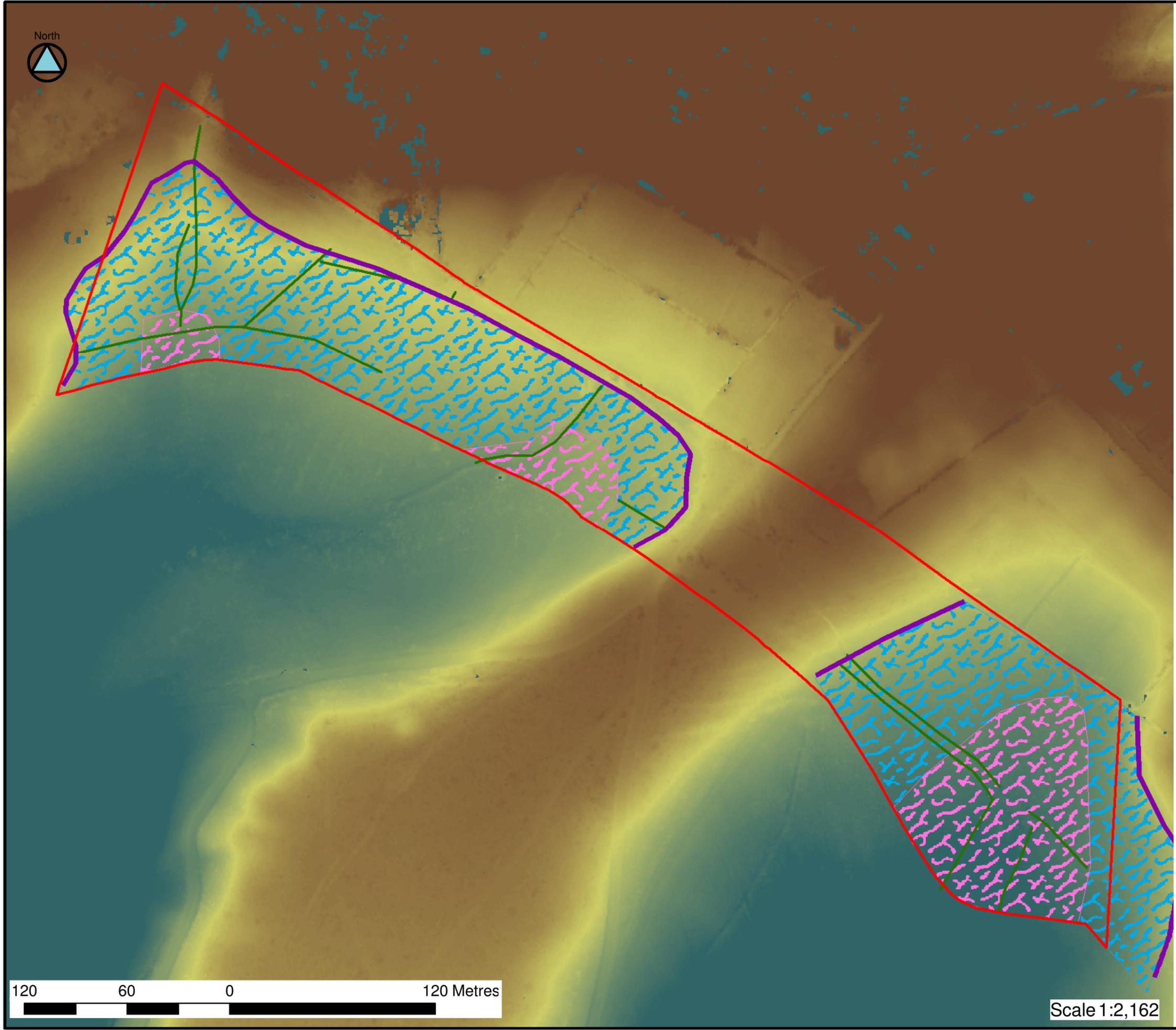


100 50 0 100 Metres

Scale 1:2,162

MAP 2

Aerial Photography

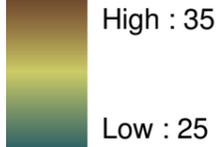


LEGEND

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

LIDAR

mAOD



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

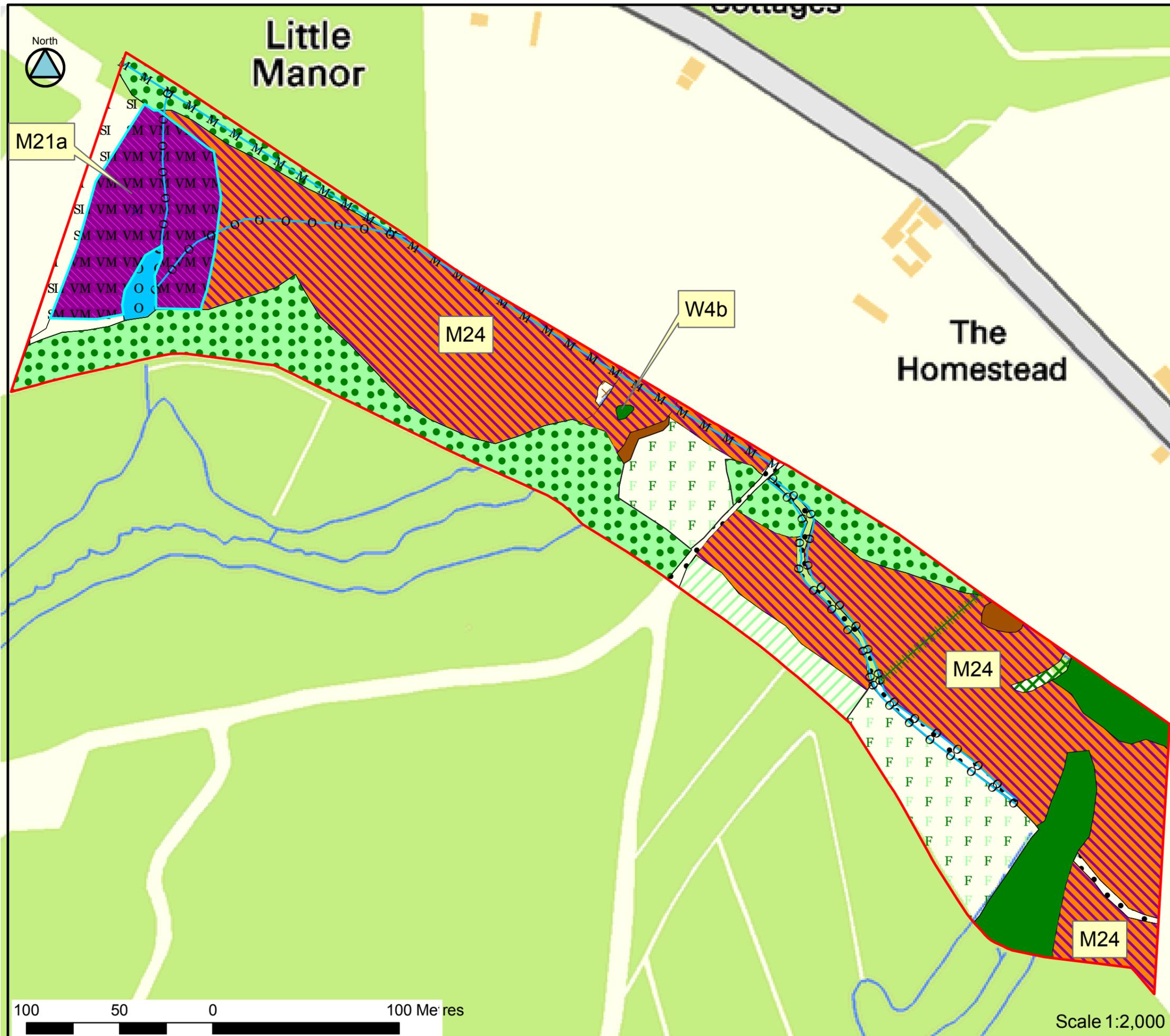


MAP 3

Topography, Hydrology and Wetland Distribution



Scale 1:2,162



LEGEND

- Ecohydrological Assessment Area

- Boundary**
- M—M G2.2
- G2.3
- ||||| J2.3.2

- Habitat**
- A1.1.1
- A1.2.2
- A1.3.1
- A2.1
- A4.3
- B5
- B6
- C1.1
- C1.2
- E3.1
- G1.3
- J4

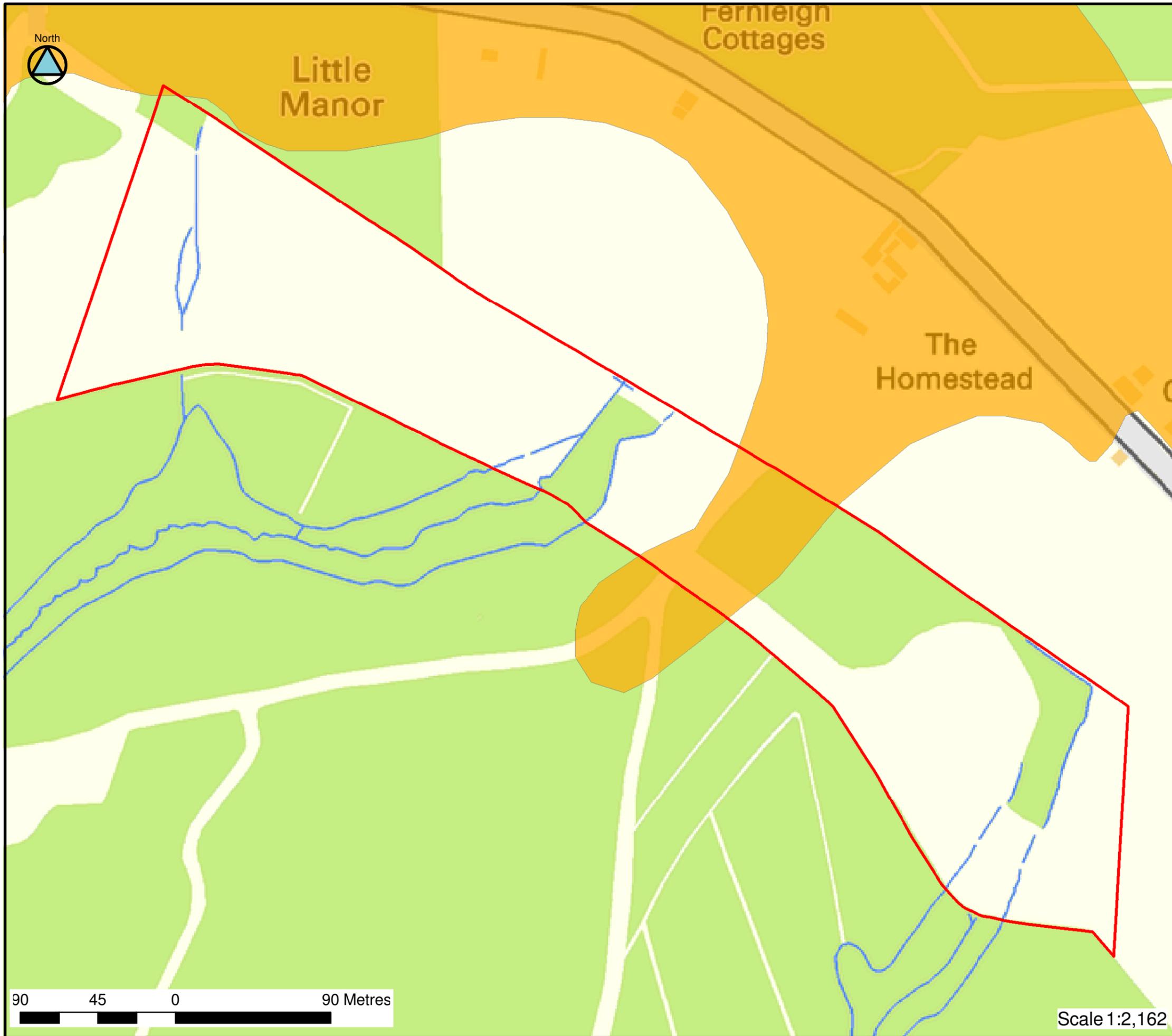
Contains Ordnance Survey data © Crown copyright and database right 2013.



MAP 4

Phase One Habitat

Scale 1:2,000



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

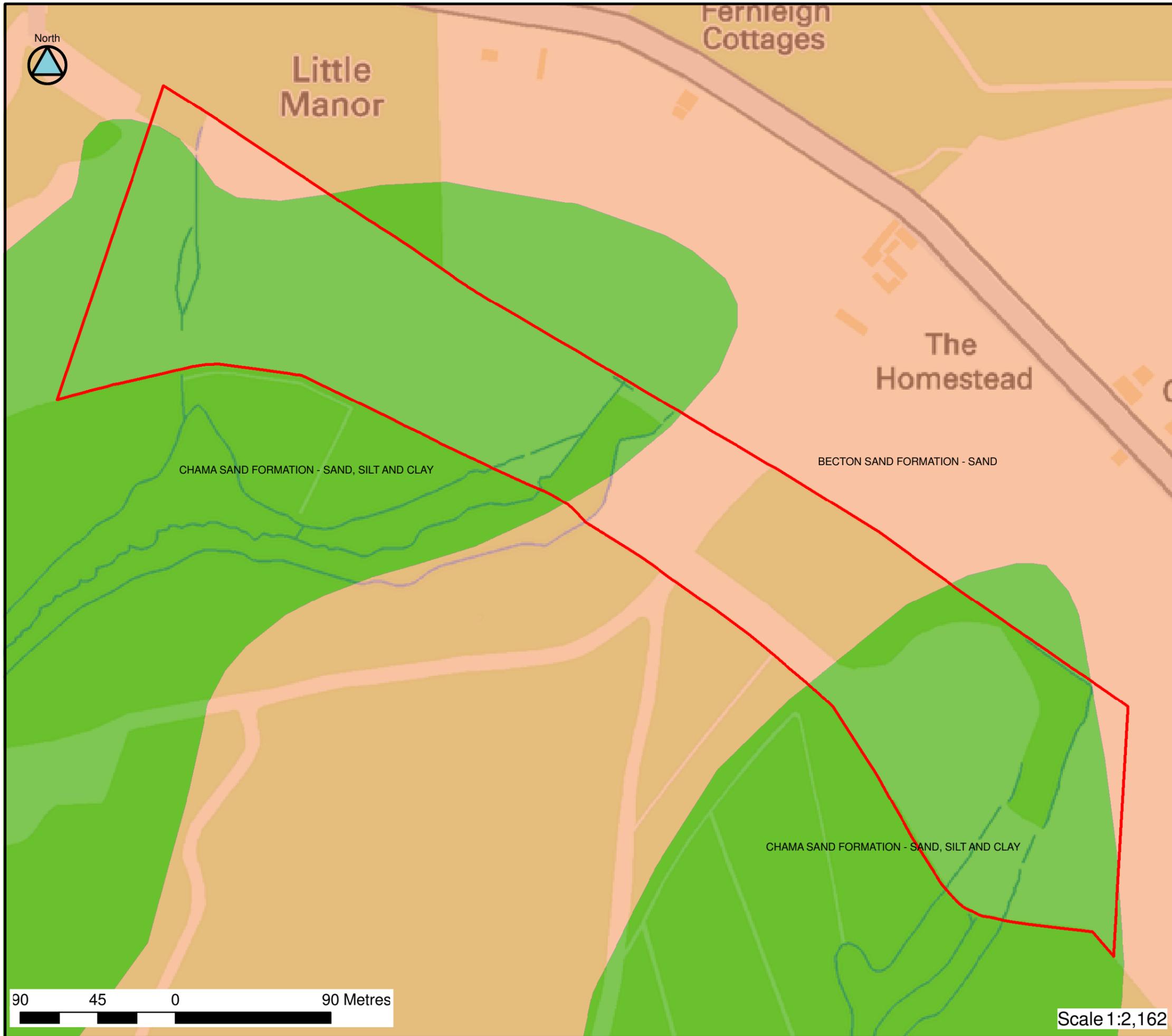
Contains Ordnance Survey data © Crown copyright and database right 2013. Natural England Licence No. 2011/052
 British Geological Survey © NERC. All rights reserved



Scale 1:2,162

MAP 5

Drift Geology



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

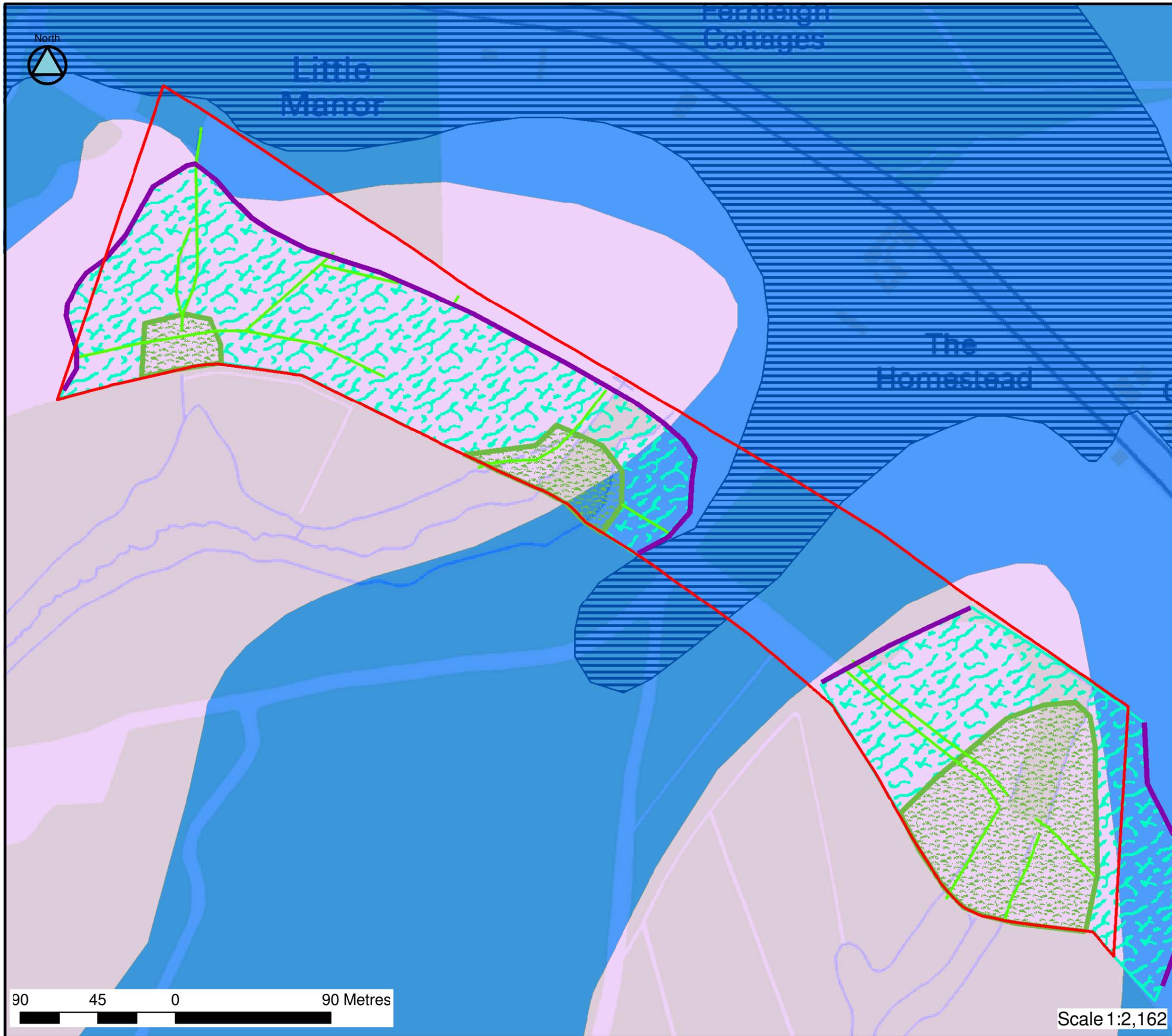
Contains Ordnance Survey data © Crown copyright and database right 2013. Natural England Licence No. 2011/052
British Geological Survey © NERC. All rights reserved



Scale 1:2,162

MAP 6

Bedrock Geology



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



MAP 7
Eco-hydrology

90 45 0 90 Metres

Scale 1:2,162



LEGEND

- Ecohydrological Assessment Area
- Drainage
- Restoration Areas

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







Scale 1:2,162

MAP 8
Restoration Plan