

Natural England Commissioned Report NECR141

# New Forest SSSI Ecohydrological Survey Overview

Annex C: Furzey Lodge Mire

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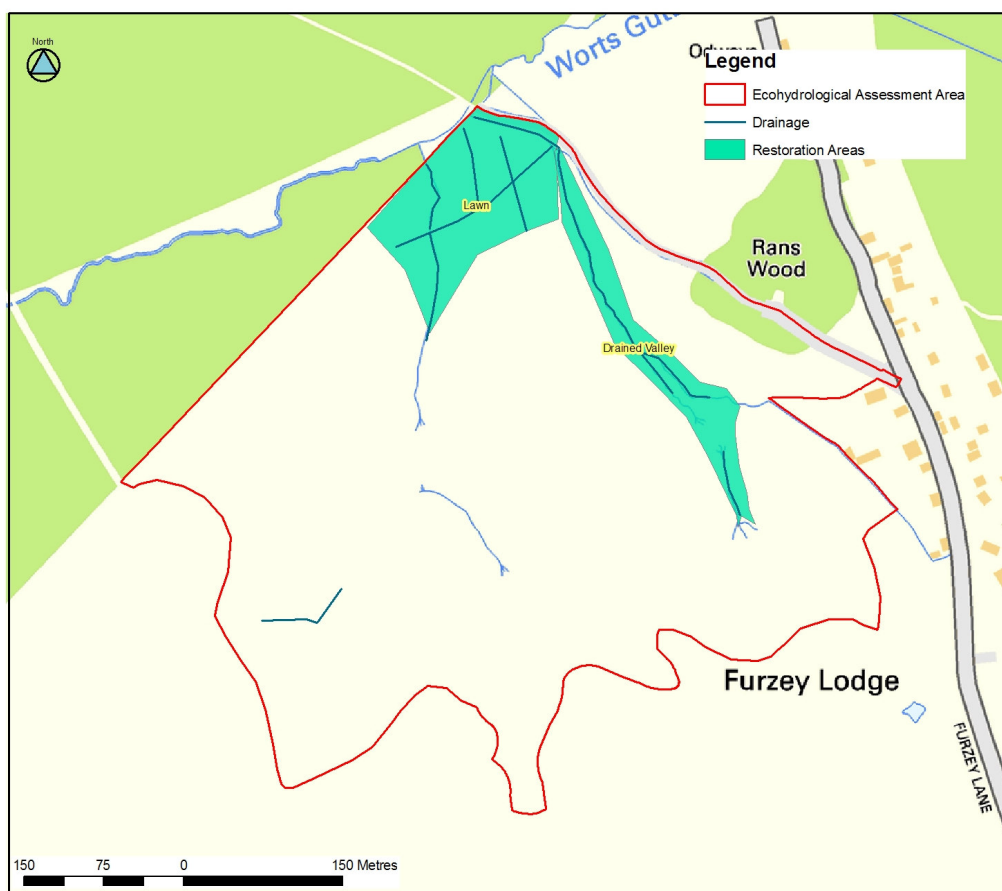
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# 1 Furzey Lodge Mire

## 1.1 Introduction

This Ecohydrological Assessment Area (EcoHAA) covers 26.4ha and is contained within SSSI Unit 447 with its centre at National Grid Reference (NGR) 436413, 102330 (see Figure 1-1).

**Figure 1-1: Location Map**



The site is a series of valley bottom flush-dominated wetlands supplied with water by the river terrace deposits that form the plateau to the south. Two valleys are occupied by relatively intact wetlands, whilst the wetland in eastern valley has been completely removed by drainage. In the northern (lowest) part of the site is an area of lawn creation along the Worts Gutter valley.

**Table 1-1: Furzey Lodge Ecohydrological Assessment Area Summary Table**

Eco-hydrological Assessment Area		C
Name		Furzey Lodge Mire
Relative Geomorphology Assessment		
Size (ha)		26.4
SSSI Units		447
Valley Side Wetland	Present	Y
	Wetland Type	Flush Dominated Wetland
	Main Source of water	Seepage from junction of River Terraces (aquifer) and Headon Beds (aquitard)
	Indicative NVC communities	M21a, M29, M24

	Wetland Types	Mire
	Drainage Damage	Y
	Scrub/Tree Encroachment Damage	Y (Major)
	Poaching and Grazing Pressures Damage	Y
Valley Basin Wetland	Present	Y
	Wetland Type	Flush Dominated Wetland
	Main Source of water	Seepage from junction of River Terraces (aquifer) and Headon Beds (aquitard)
	Indicative NVC communities	M25a, W4b
	Wetland Types	Mire/ wet heath/ wet grassland
	Drainage	Y - valley centre drain with offshoots (Moderate); lawn creation (Moderate), Eastern Valley (Major)
	Scrub/Tree Encroachment Damage	N
	Poaching and Grazing Pressures	N
Additional Comments		Wider valley bottom areas have been subject to significant drainage. The water supply mechanisms and geology are very similar to Lodge Heath mire

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 consists of three shallow small valleys which drain northwards towards a stream called Worts Gutter. The southern (upper) part of the site is the edge of a large plateau area.

The two western valleys join midway down to form one larger valley. There are a number of small drainage paths occupying these valleys. It is unclear in the upper reaches whether these are natural in origin. In the lower reaches the valley joins an area of lawn creation (i.e. a pattern of small foot drains) where it enters the Wort Gutter valley. In the lawn area the central drain appears to have been artificially deepened.

The eastern valley has been subject to artificial drainage with a small drain at its base (Figure 1-2). This has removed any wetlands from the valley except for a small undrained area in its upper reaches.

Figure 1-2: Drain at base of eastern valley looking northwards at NGR 436600, 102386



### 1.3 Ecology

The unit comprises of two separate valley head mires, both of which have formed either side of a large hill. The mires join into a large raised mire at the valley bottom, through which a drain has been cut. As a consequence the mire is drier at the bottom and more representative of grassland-heath mosaic. The drain channel contains aquatic vegetation including Bog Pondweed *Potamogeton polygonifolius*, Soft Rush *Juncus effusus*, Water Starwort *Callitriche* sp. and Fool's Water-cress *Apium nodiflorum*. The valley mire is bordered by wet heath habitat consisting of Heather *Calluna vulgaris*, Cross-leaved Heath *Erica tetralix* and Purple Moor-grass *Molinia caerulea* tussocks. The higher areas are obviously drier and dominated by Gorse *Ulex europaeus* scrub and Bracken *Pteridium aquilinum*. Pine encroachment is a particular problem across the whole of this site.

Towards the east of the site a small seepage face has led to a valley mire habitat forming, however this is heavily drained and seems to be in transition as it becomes drier with Gorse and Birch *Betula pendula* scrub encroaching. In the north of the unit a small mixed woodland is present with a drain running through the middle of it. The ground flora consists of closely grazed grassland.

### 1.4 Geology and Hydrogeology

Table 1-2 shows the geology at Furzey Lodge. The river terrace deposits are confined to the plateau area to the south of the site and the edge of these deposits appears to be located approximately 50m south of where it is indicated on 1:50,000 geological mapping published by the British Geological Survey (BGS).

Table 1-2: Geology and Hydrogeology

Age	Group	Formation / Member	Description	Thickness	Hydrogeological Role
Quaternary	N/A	River terrace	CLAY, SILT, SAND and	?	Aquifer

		deposits	GRAVEL.		
Tertiary (Eocene)	Solent Group	Headon Formation and Headon Hill Formation	Greenish grey shelly CLAY with laminated SAND, SILT and CLAY.	Up to 49 m	Aquitard
BGS digital 1:50,000 geology mapping, Melville and Freshney (1982), Edwards and Freshney (1987), Bristow <i>et al.</i> (1991), Jones <i>et al.</i> (2000), Barton <i>et al.</i> (2003), and Neumann <i>et al.</i> (2004).					

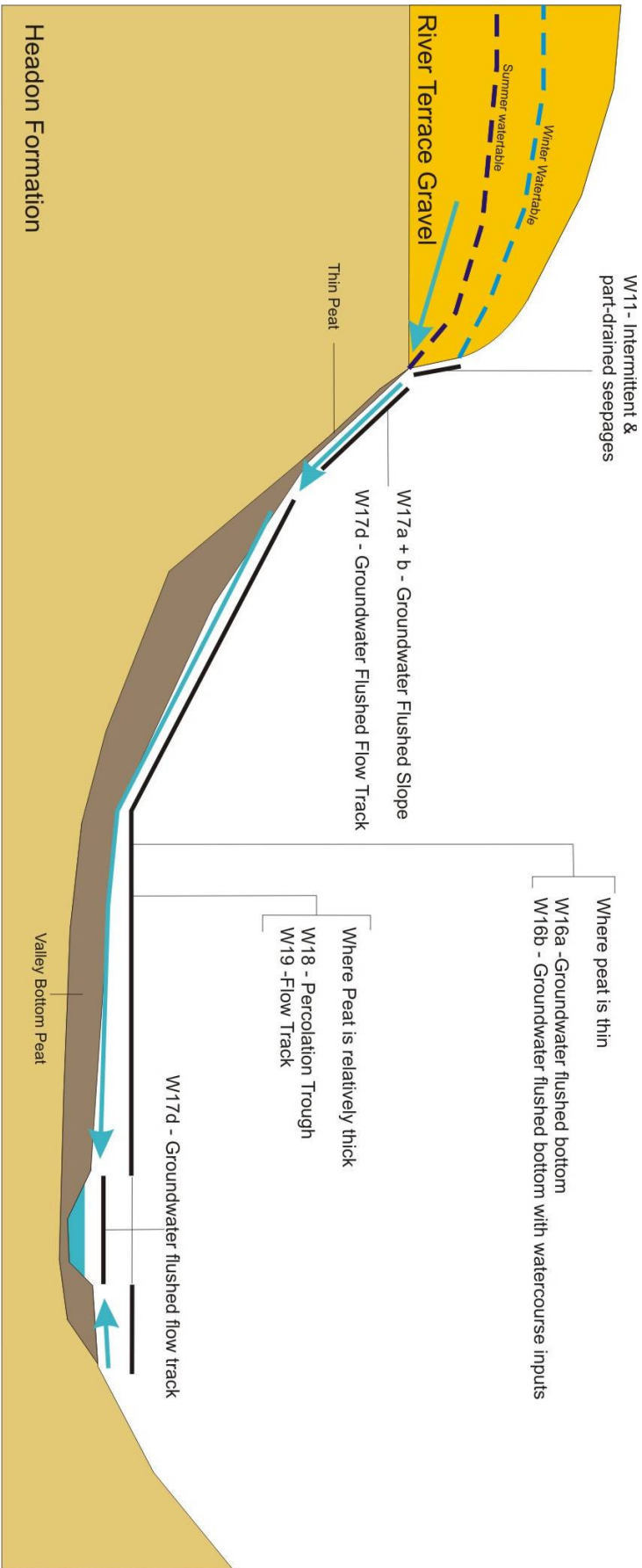
Local BGS borehole logs (available at <http://www.bgs.ac.uk/GeoIndex/>) describe the river terrace deposits as sandy gravel (likely to be relatively permeable and to act as an aquifer) and the Headon Formation as a greenish grey clay (likely to act as an aquitard).

Within the upper parts of the most western valley the centre of the wetland is raised suggesting a significant depth of peat. Elsewhere, the deposits within the wetlands comprise thinner peat soils.

## 1.5 Water Supply Mechanisms

The wetlands on site are flush dominated. They receive water from a seepage face at the junction between river terrace deposits (aquifer) and the underlying Headon Formation (aquitard). The water runs over the surface of the low permeability Headon Formation, forming narrow flushed slopes before reaching the shallow valley bottoms.

Figure 1-3: 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.

Western valley peat area- valley bottom basin - W18 and W19.

Other valley bottom basins - W16a, W17d and W19.

## 1.6 Damage and Restoration

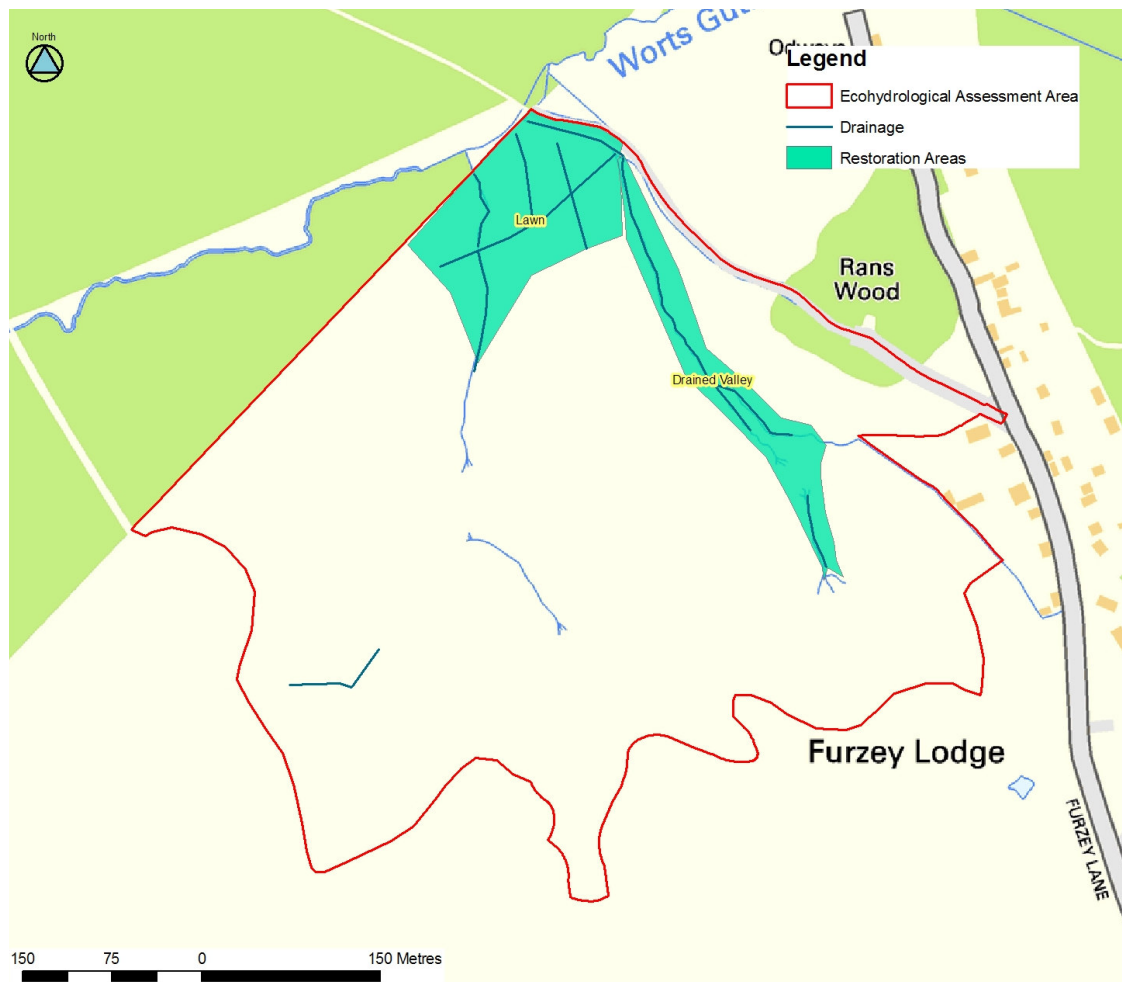
### 1.6.1 Damage

There are two areas of significant drain damage (see Figure 1-4):

- Drained Valley - the eastern valley where a valley bottom central drain has removed the wetland. Only mineral soils remain in this area.
- Lawn - lawn creation area in the northern part of the site.

Within the other valleys it is unclear whether the flow paths are natural in origin or not.

**Figure 1-4: Restoration Areas Map**



The site is becoming increasingly unfavourable as Pine encroachment and scrub are beginning to dominate in some areas, especially in the north east of the site. The drain at the bottom of the main wetland is compromising the mire habitat (which runs directly alongside it)

and some areas are becoming drier, resulting in wet heath-grassland mosaic habitats forming instead, which are likely to become increasingly drier and scrubbed over without intervention.

### 1.6.2 Restoration

Given that the two areas of drainage have almost completely removed the wetland habitats that existed in the past, robust restoration objectives should be developed for the site. For these areas to restore back to their former state will not just require drainage controls but also the build up of peaty soils over a long period of time. If the objectives developed for the site are the restoration of the wetlands, the following is recommended:

- Drained Valley - the drain should be infilled or blocked at regular intervals with earth bunds or bunds of other materials;
- Lawn - the lawn area appears to extend beyond the site unit boundary along Worts Gutter. Any restoration of this area should be developed to encompass plans for the whole Worts Gutter floodplain. The drain that enters from the main wetland areas should be infilled or blocked at regular intervals with earth bunds or bunds constructed from other materials;
- Scrub clearance - particularly of the pine that is encroaching into several areas. Control of Gorse - stands should not be allowed to encroach into mire and wetland areas, however, if they become wetter, this will no longer be a problem

## 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. The surface water features are small and appear stable which limits the need for monitoring.

### 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.

**Table 1-3: Monitoring Requirements**

Eco-hydrological Assessment Area	SSSI Units	Site Names	Requirements for monitoring: ecology	Requirements for monitoring: hydrology (number of installations estimated)
C	447	Furzey Lodge Mire	Fixed point camera and transect survey (specifically focussing on extent of pine scrub encroachment) Fixed point quadrat survey	Flush dominated wetland – little peat – 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**

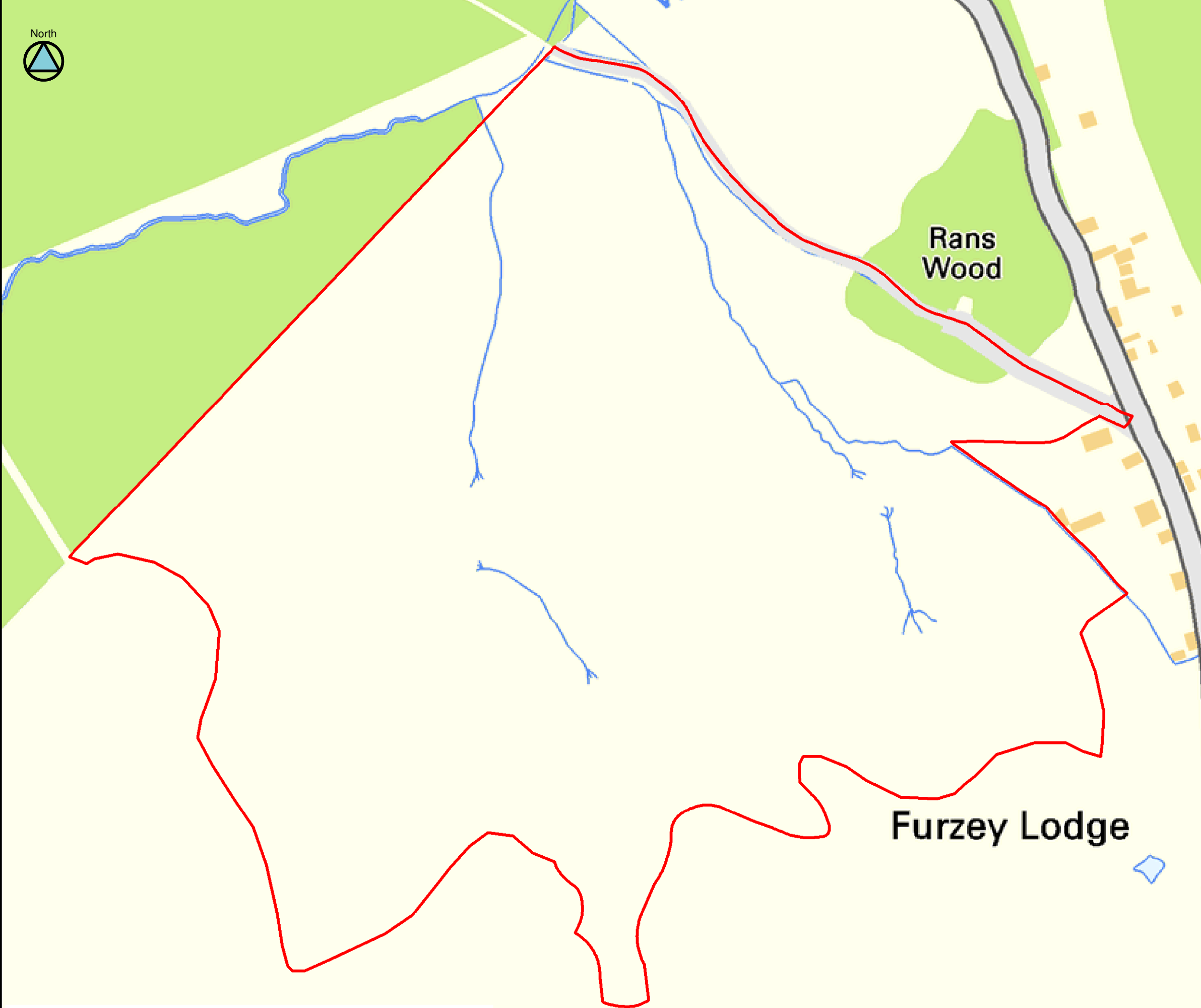
**Map 7: Eco-Hydrology Map**

**Map 8: Restoration Plan**



LEGEND

 Ecohydrological Assessment Area



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Scale 1:2,640

MAP 1

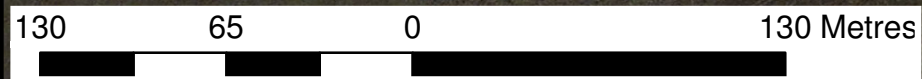
Site Location



LEGEND

 Ecohydrological Assessment Area

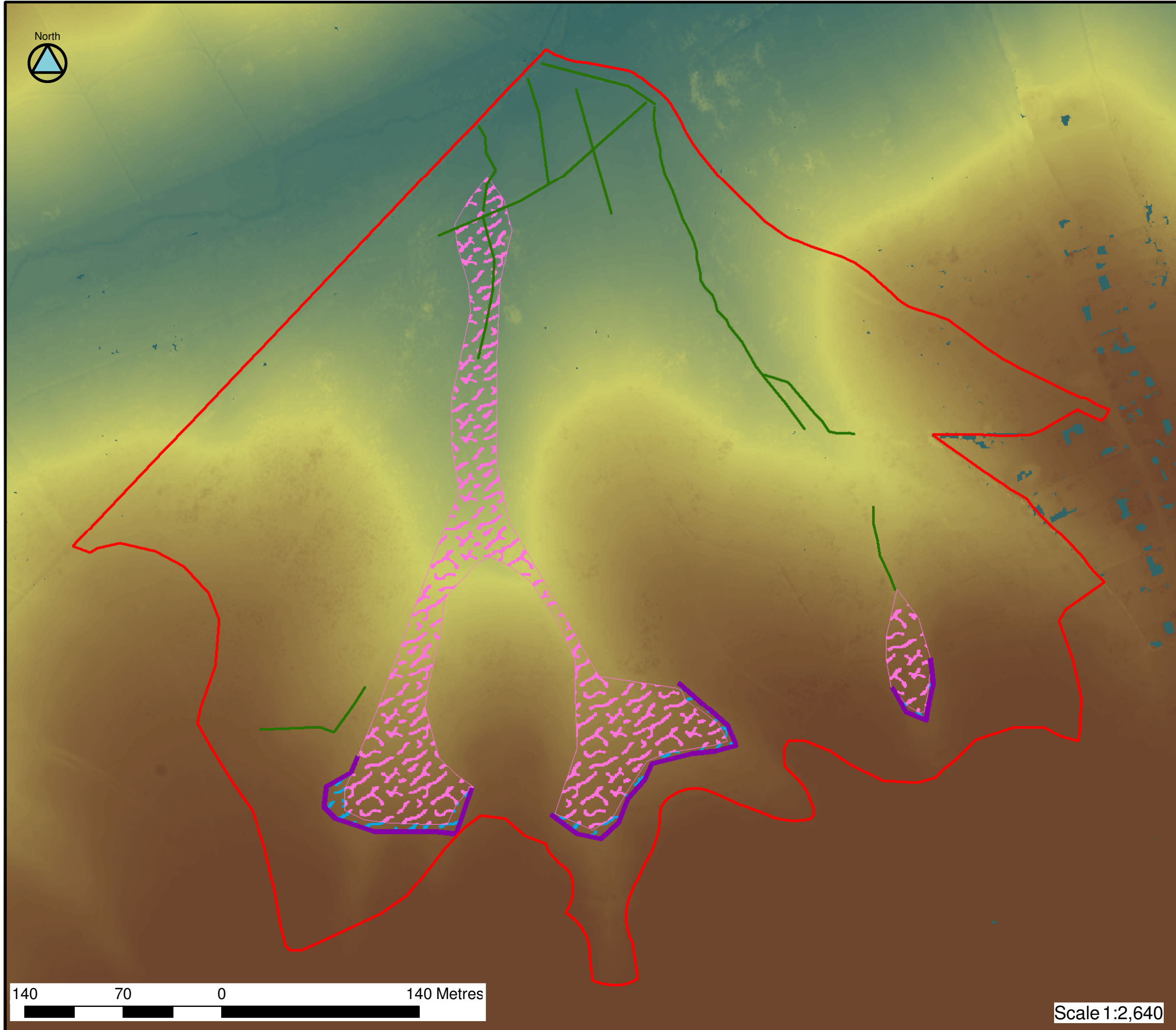
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MAP 2

Aerial Photography

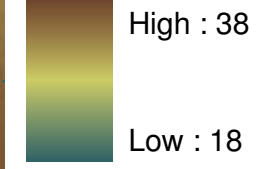


**LEGEND**

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

**LIDAR**

**mAOD**



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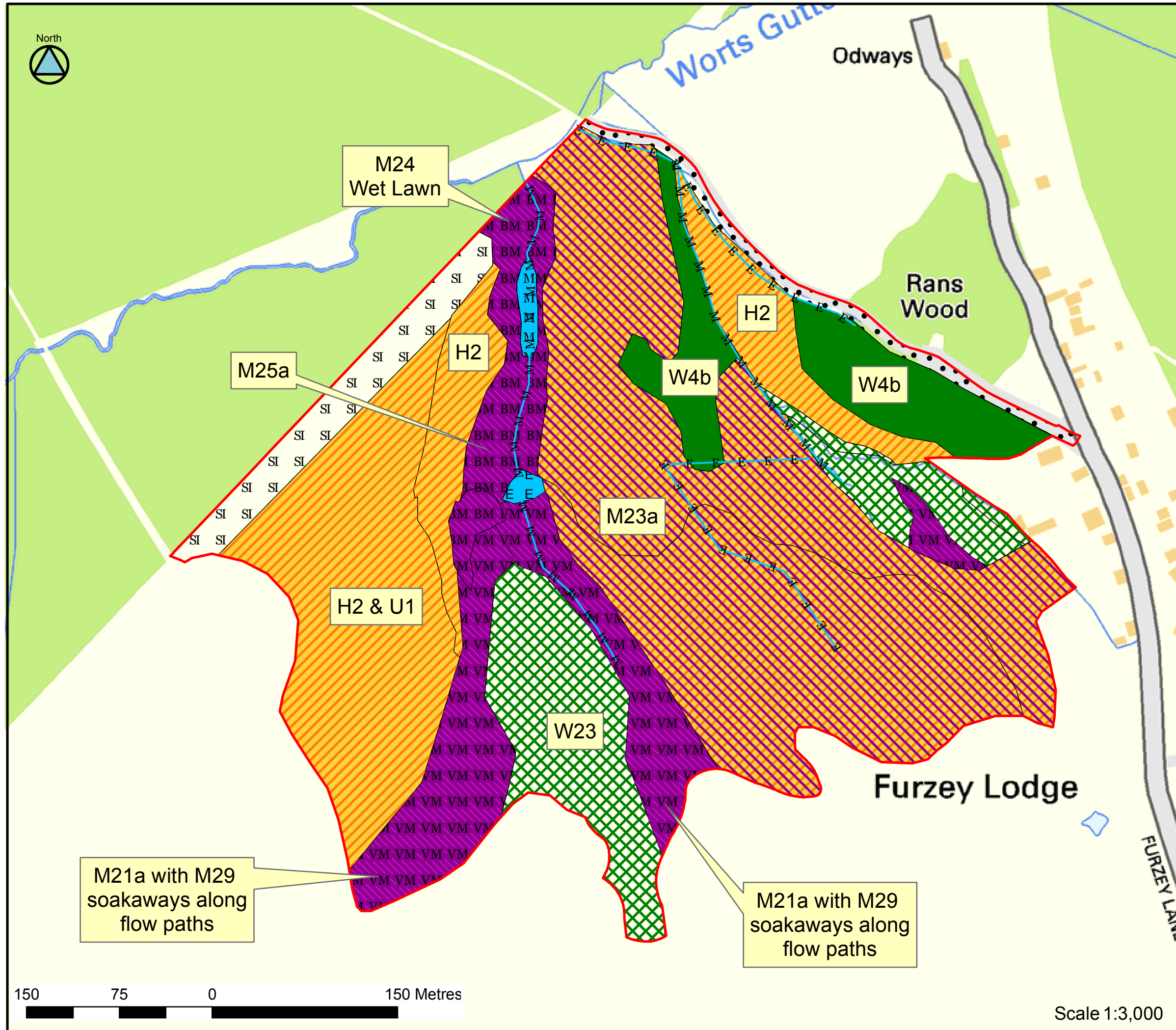


**MAP 3**
















Topography, Hydrology and Wetland Distribution



Scale 1:2,640



**LEGEND**

-  Ecohydrological Assessment Area
-  G2.1
-  G2.2
-  A1.1.1
-  A2.1
-  A2.2
-  B6
-  D5
-  D6
-  E3.1
-  E3.2
-  G1.1
-  G1.2
-  G2.2
-  J4

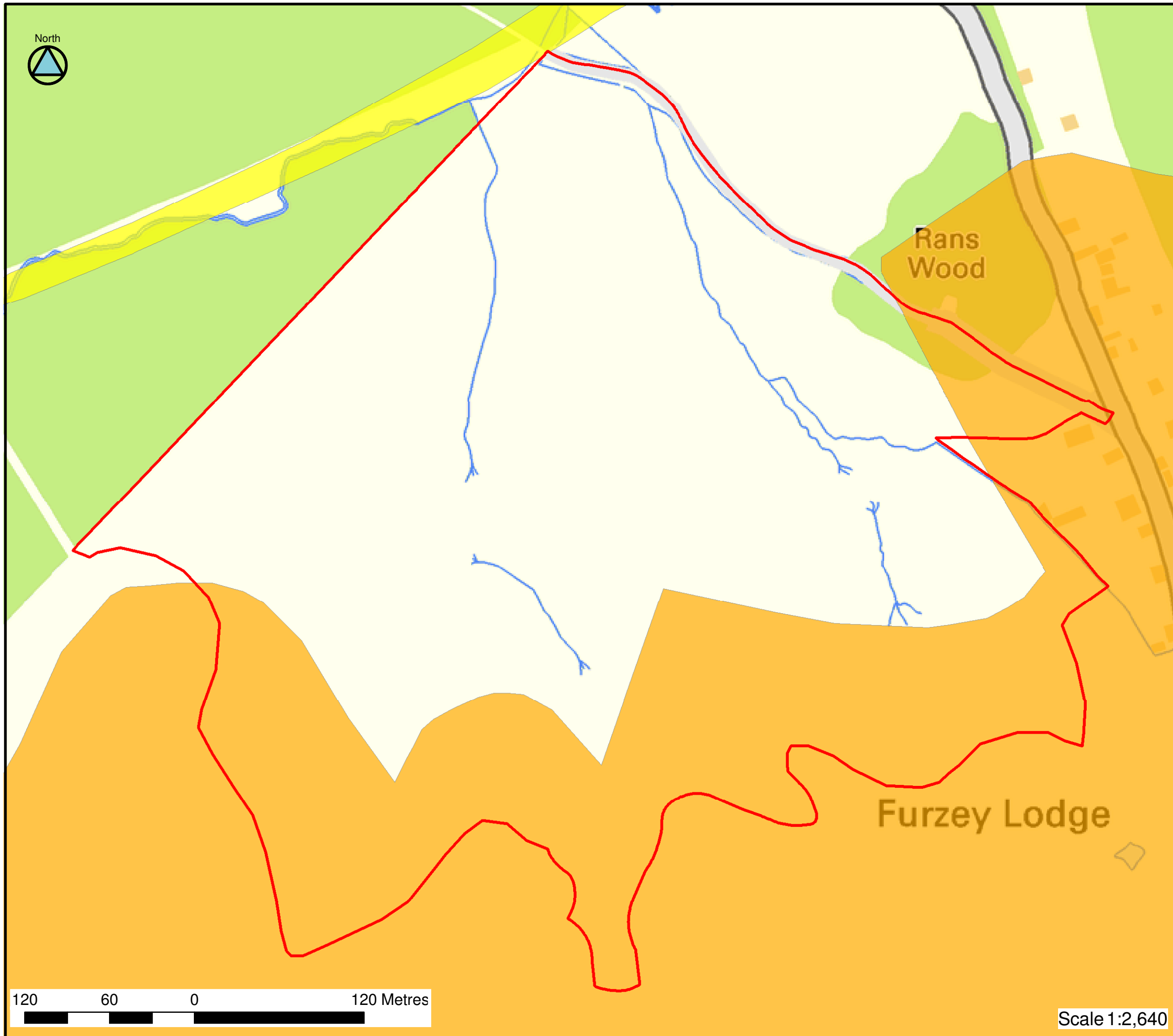
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**MAP 4**  
Phase One Habitat



Scale 1:3,000



**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

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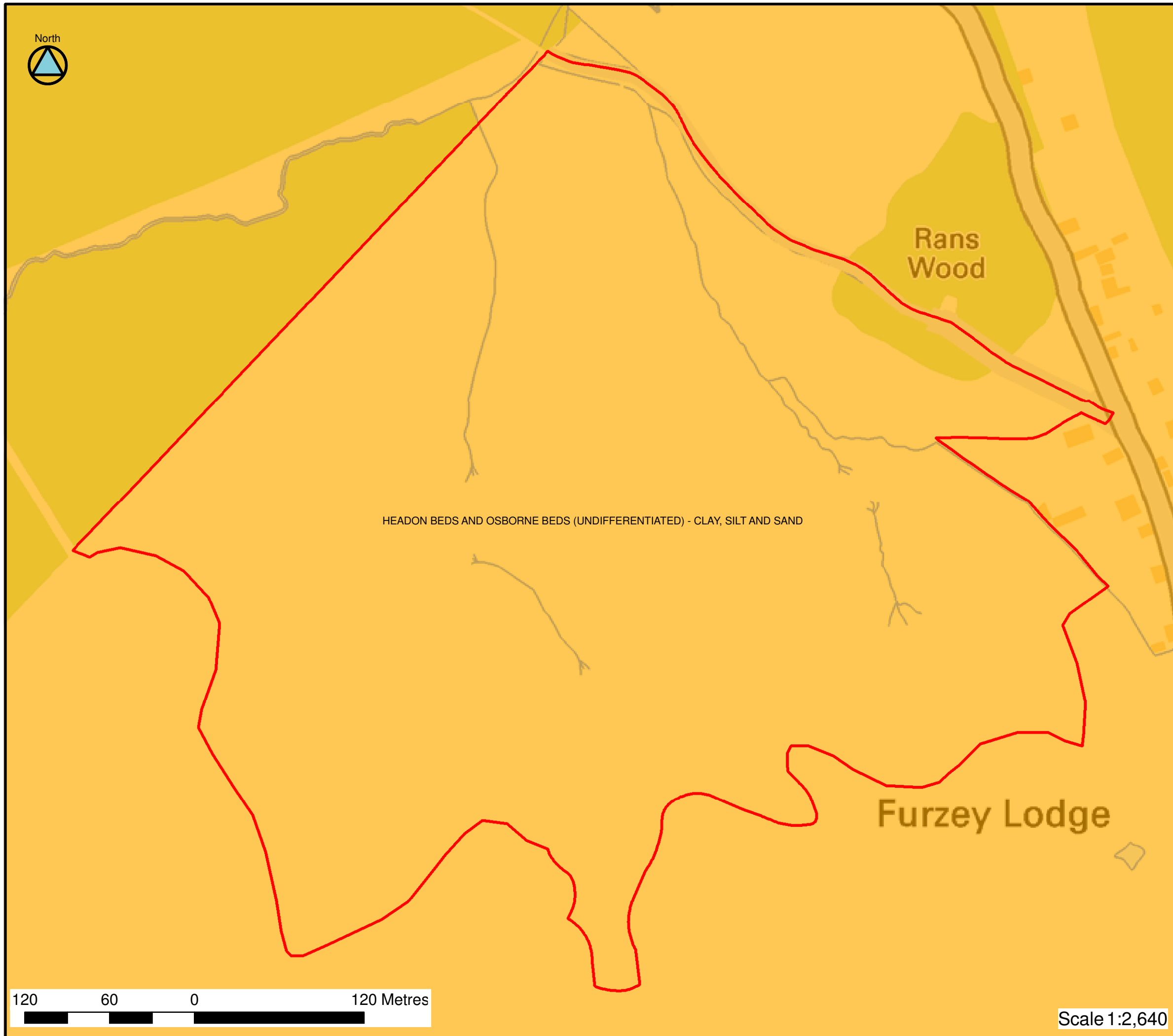
**MAP 5**

Drift Geology



Scale 1:2,640





**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

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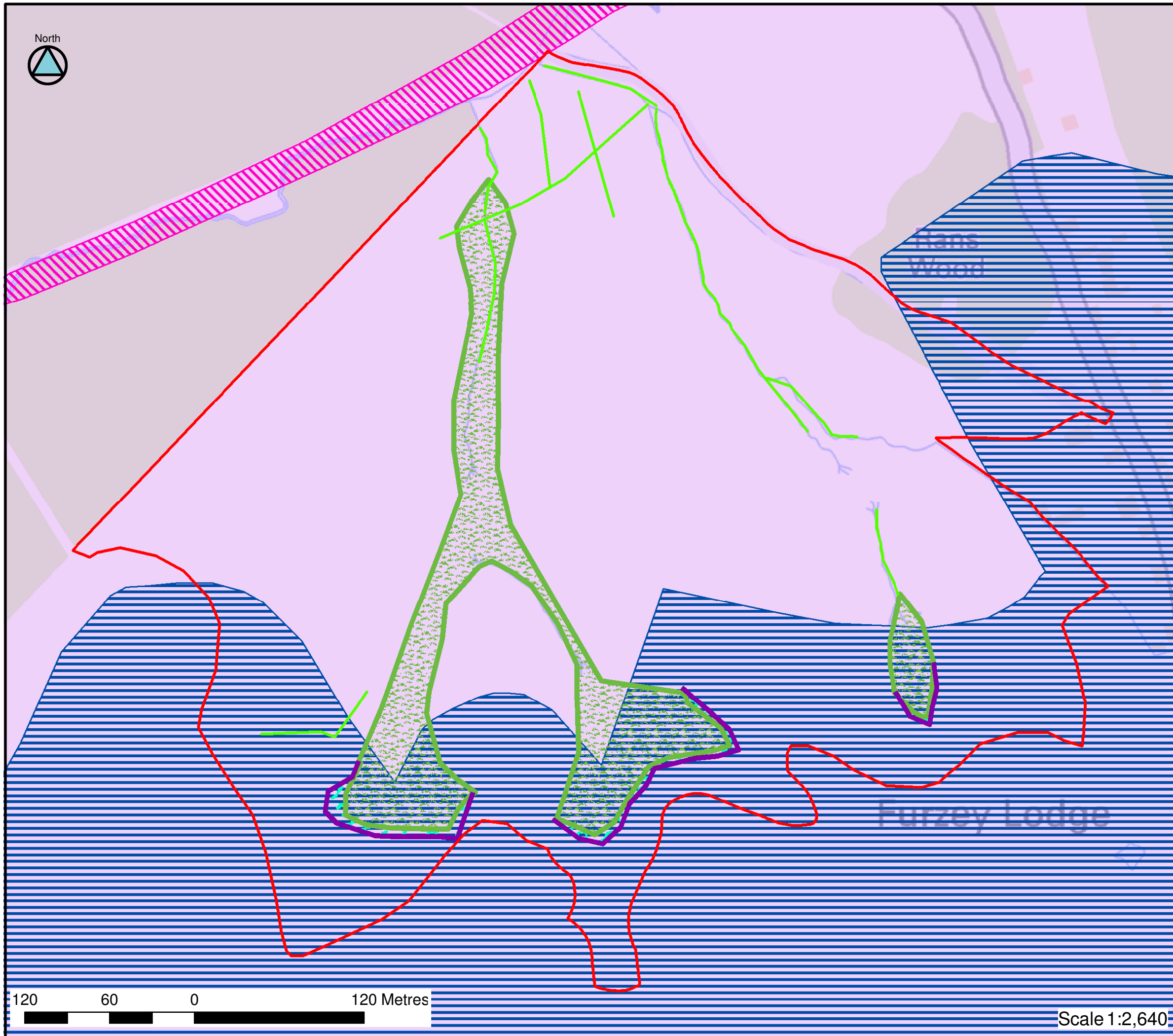


**MAP 6**

Bedrock Geology



Scale 1:2,640



**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

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MAP 7




Eco-hydrology

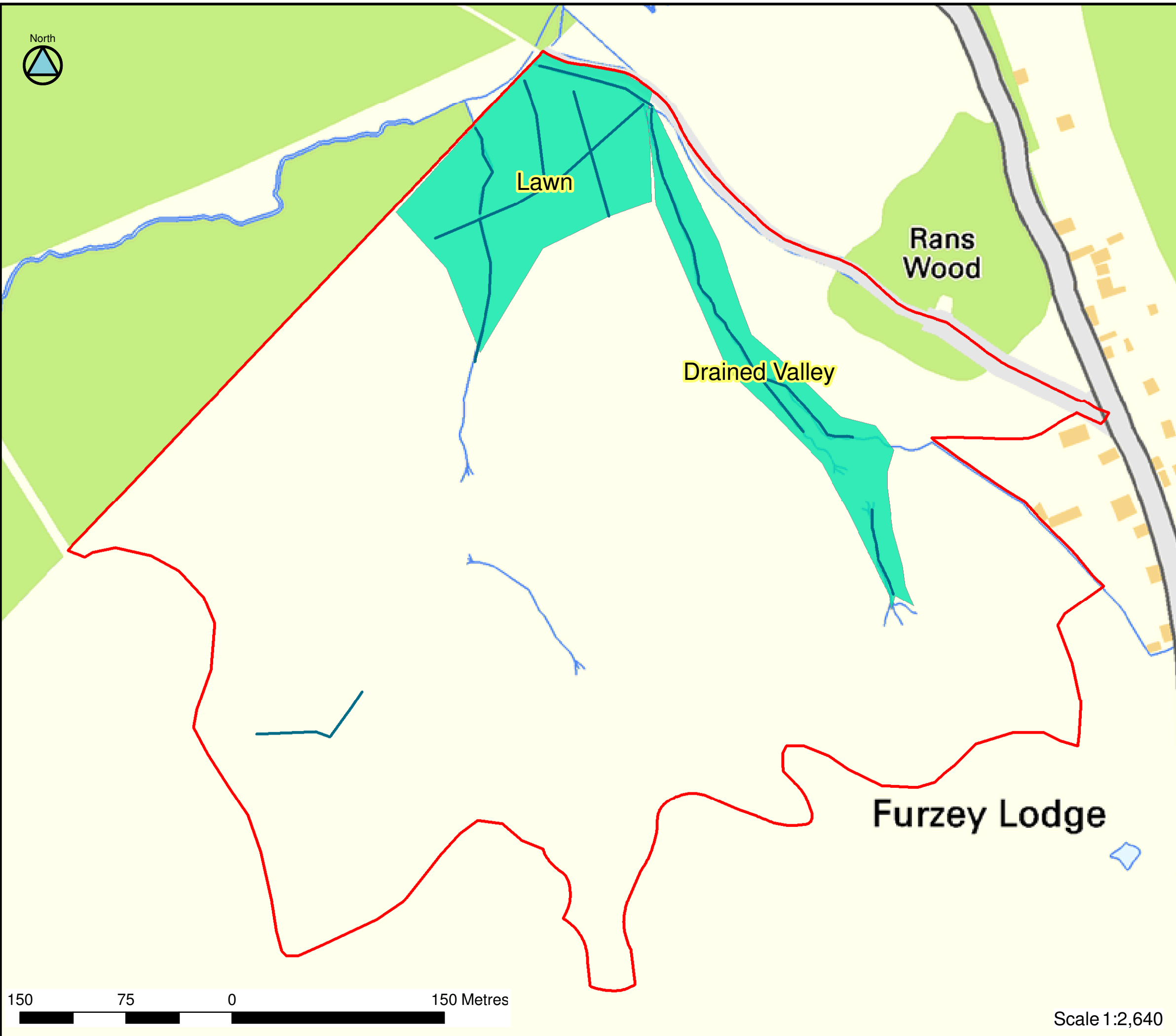


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**LEGEND**

-  Ecohydrological Assessment Area
-  Drainage
-  Restoration Areas



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**MAP 8**

Restoration Plan

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