

Natural England Commissioned Report NECR141

New Forest SSSI Ecohydrological Survey Overview

Annex S: Ogdens Purlieu

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Contents

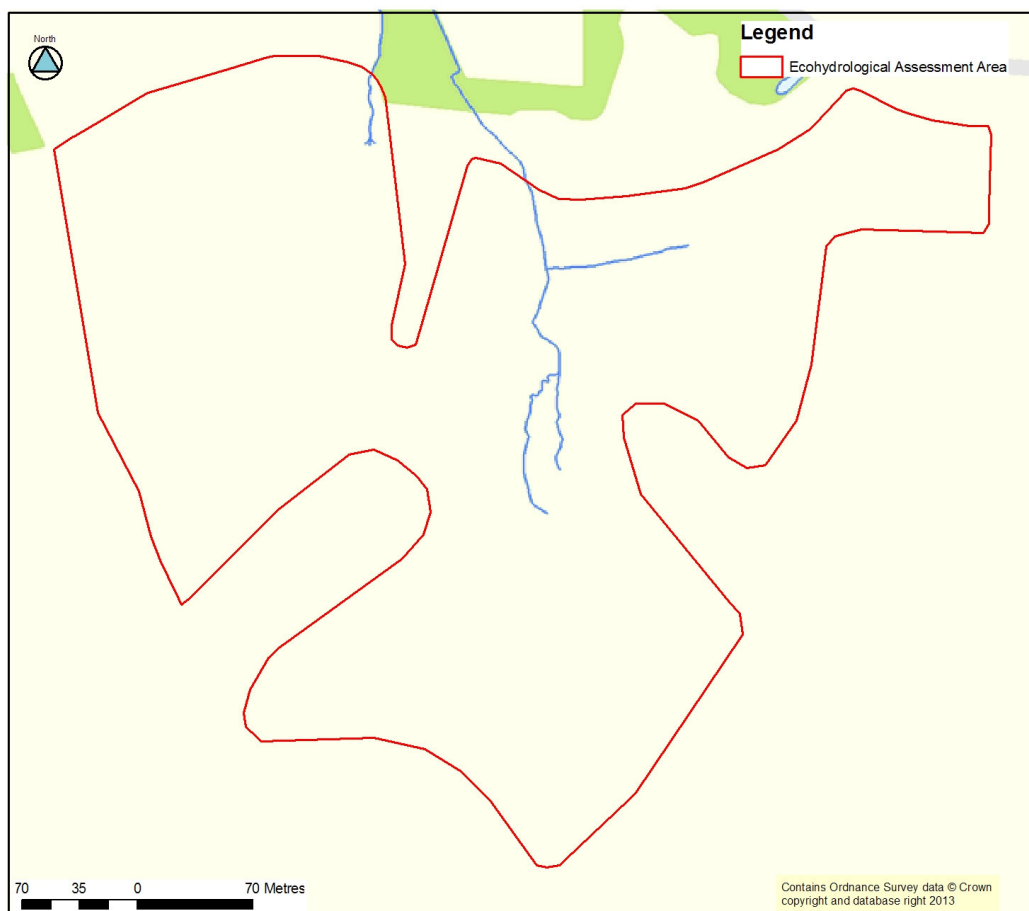
1	Ogdens Purlieu	2
1.1	Introduction	2
1.2	Topography and Wetland Distribution	3
1.3	Ecology	5
1.4	Geology and Hydrogeology	6
1.5	Water Supply Mechanisms	6
1.6	Damage and Restoration.....	8
1.7	Monitoring requirements.....	9
2	Maps.....	10

1 Ogdens Purlieu

1.1 Introduction

This Ecohydrological Assessment Area (EcoHAA) covers 13.8ha and is contained within SSSI Unit 50 with its centre at National Grid Reference (NGR) 418301, 111650 (see Figure 1-1).

Figure 1-1: Location Map



The site occupies two adjoining valleys divided by a low ridge with wetlands in the bottom of both. The upper part of the site is underlain by the Selsey Sands which locally are a coarse sand. This acts as an aquifer supplying the seepage dominated wetlands. In the lower part of the site, the sand is replaced by clay and the wetlands become flush dominated. In the lower part of the eastern valley an area of drainage has damaged the wetland.

Table 1-1: Ogden Purlieu Ecohydrological Assessment Area Summary Table

Eco-hydrological Assessment Area		T
Name		Ogden's Purlieu
Relative Geomorphology Assessment		
Size (ha)		13.9
SSSI Units		50
Valley Side Wetland	Present	Y
	Wetland Type	Seepage Dominated
	Main Source of water	Seepage from Sand units within Selsey Sand Formation
	Indicative NVC communities	H2ac, H3abc, M16abc, M23a, M29, M25a, M9a, U4
	Wetland Types	Mire, Wet heath, Wet grassland
	Drainage Damage	N

	Scrub/Tree Encroachment Damage	Y - some scrub on sides, former stands of trees now removed (Minor)
	Poaching and Grazing Pressures Damage	N
Valley Basin Wetland	Present	Y
	Wetland Type	Flush Dominated Wetland/seepage dominated
	Main Source of water	Valley bottom is underlain by clay (head), however smaller headwater valleys underlain by sand and are seepage dominated
	Indicative NVC communities	M21a, M23a, M25a, M30, M16abc, H3abc, U4
	Wetland Types	Mire, Wet heath, Wet grassland
	Drainage	Y - central drain cut in one of the two valley (Major)
	Scrub/Tree Encroachment Damage	Y - associated with head of drainage cut - Pine, Birch, Gorse
	Poaching and Grazing Pressures	Y (minor) at a fording point
Additional Comments		Complex small wetland combining areas of seepage dominated wetland in the upper areas with a larger valley underlain by clay. One of the larger valleys has been subject to significant drainage.

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, ecology, hydrogeology, 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 two adjoining valleys surrounded by a plateau separated by a low ridge (see Figure 1-2 and Figure 1-3). In the lower part of the eastern valley there is a series of small drains (see Figure 1-4). The small stream at the bottom of the western valley appeared natural.

Figure 1-2: Western Valley Bottom Wetland (NGR 418235, 111640)



Figure 1-3: Upper Eastern Spur of the Eastern Valley Bottom Wetland (NGR 418510, 111770)



Figure 1-4: Drainage at base of the Eastern Valley Bottom Wetland



1.3 Ecology

The central areas of the unit appear broadly natural with good communities of M29 (*Hypericum elodes*-*Potamogeton polygonifolius* soakway) surrounded by M21a (*Narthecium ossifragum*-*Sphagnum papillosum* valley mire, *Rhynchospora alba*-*Sphagnum auriculatum* sub-community) and M24c (*Molinia caerulea*-*Cirsium dissectum* fen-meadow, *Juncus acutiflorus*-*Erica tetralix* sub-community). These areas are bounded by wet heath, M16a (*Erica tetralix*-*Sphagnum compactum* wet heath, typical sub-community) with areas of dry heath (H2a - *Calluna vulgaris*-*Ulex minor* heath, typical sub-community) occurring around the valley heads and along the central ridge. This is a typical situation in the New Forest where these habitats form a succession from the seepage faces down to the valley bottoms and the nascent streams within them. Above the seepage faces, dry heath habitats become dominant and in places, such as here, Gorse *Ulex europeaus* can develop into 'Furzes', a feature of the New Forest that was traditionally managed by burning.

Tree and scrub incursion has been controlled in the past with exposed stumps and piles of brash still evident across the central ridge. There remain some large furzes around the tops of the valleys, but these are in association with the drier H2a community.

One of the central ditches within the eastern valley has mixed scrub developing on the spoil heaps. This is comprised of Scot's Pine *Pinus sylvestris*, Silver Birch *Betula pendula* and Gorse. The effect of draining this valley has resulted in strips of H2a being allowed to develop parallel with the watercourse, replacing the valley mire habitats that would have formerly been present in this area. This has led to the impoverishment of the wetland riparian zone at the bottom of this valley.

1.4 Geology and Hydrogeology

Table 1-2 shows the geology at Odgen Purlieu. The upper part of the site and the surrounding hills are formed from the Selsey Sand Formation. Site augering has shown this to be composed of coarse grey sand and it acts as an aquifer. In the lower parts of the two valleys, the Selsey Sand is replaced by Head overlying the Poole Formation. Exposures in this area show that the bottom of these areas is underlain by clay - whether this clay is the Head or Poole Formation was unclear from the site walk-over, however, this layer acts as an aquitard.

Table 1-2: Geology and Hydrogeology

Age	Group	Formation - member	Description	Thickness	Hydrogeological Role	Water Resources
Quaternary		Head	CLAY		Aquifer / Aquitard	
Tertiary (Eocene)	Bracklesham Group	Selsey Sand Formation	Fine-grained SAND, sandy SILT and sandy CLAY; locally shelly and glauconitic.	0 – 50 m	Aquifer / Aquitard - Spring line at base	Variable lithology makes borehole yield hard to predict. Boreholes up to 200 mm in diameter may yield up to 200 m ³ /d; boreholes over 400 mm diameter have yielded more than 1800 m ³ /d from sandier strata. However, boreholes with little or no yield have been recorded.
	Bracklesham Group	Poole Formation	Fine- to very coarse-grained (locally pebbly) cross-bedded, commonly lignitic, SAND. Interbedded with pale grey to dark brown, carbonaceous, lignitic and (commonly) laminated CLAY. Red-stained structureless clay and silty clay present locally.	25 – 110 m	Aquifer / Aquitard - Spring line at base	

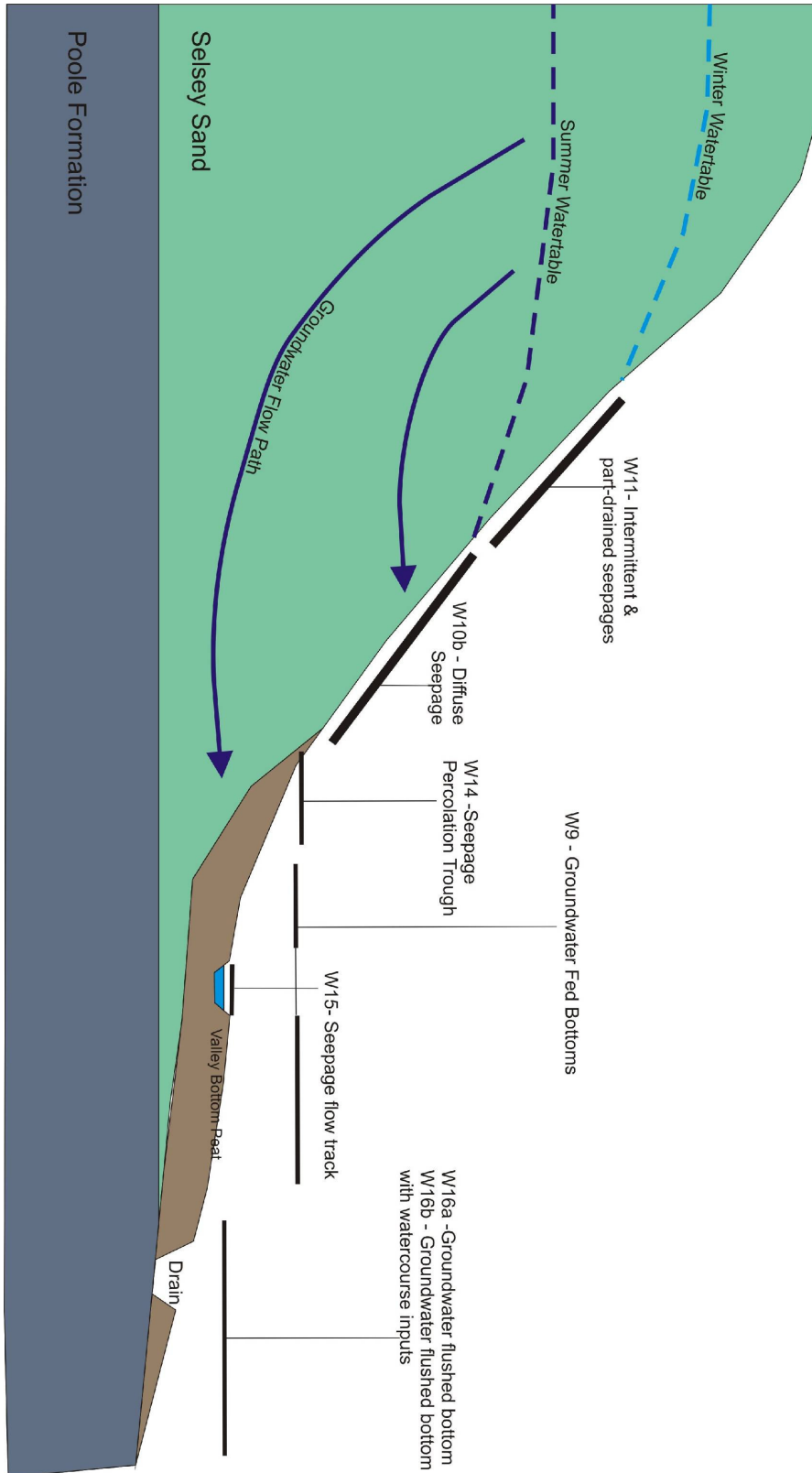
Local BGS borehole logs (available at <http://www.bgs.ac.uk/GeoIndex/>) describe

1.5 Water Supply Mechanisms

Odgen Purlieu is a complicated wetland. The upper part of the site (and the upper part of the wetlands) is underlain by the coarse sand Selsey Formation from which it receives groundwater flow and so is seepage dominated. Within the valley bottoms in this area peat has accumulated (augering showed up to 50cm in thickness).

The lower parts of the site are underlain with clay. The seepage dominated wetland valley bottom transitions into a flush dominated wetland valley bottom. In this area, without significant groundwater input, the drainage appears more effective and the peat has wasted.

Figure 1-5: 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.

The WETMECS identified include:

Valley side wetlands underlain by Selsey Sands - W11 and W10b;

Valley bottom wetlands underlain by Selsey Sands - W14 and W9;

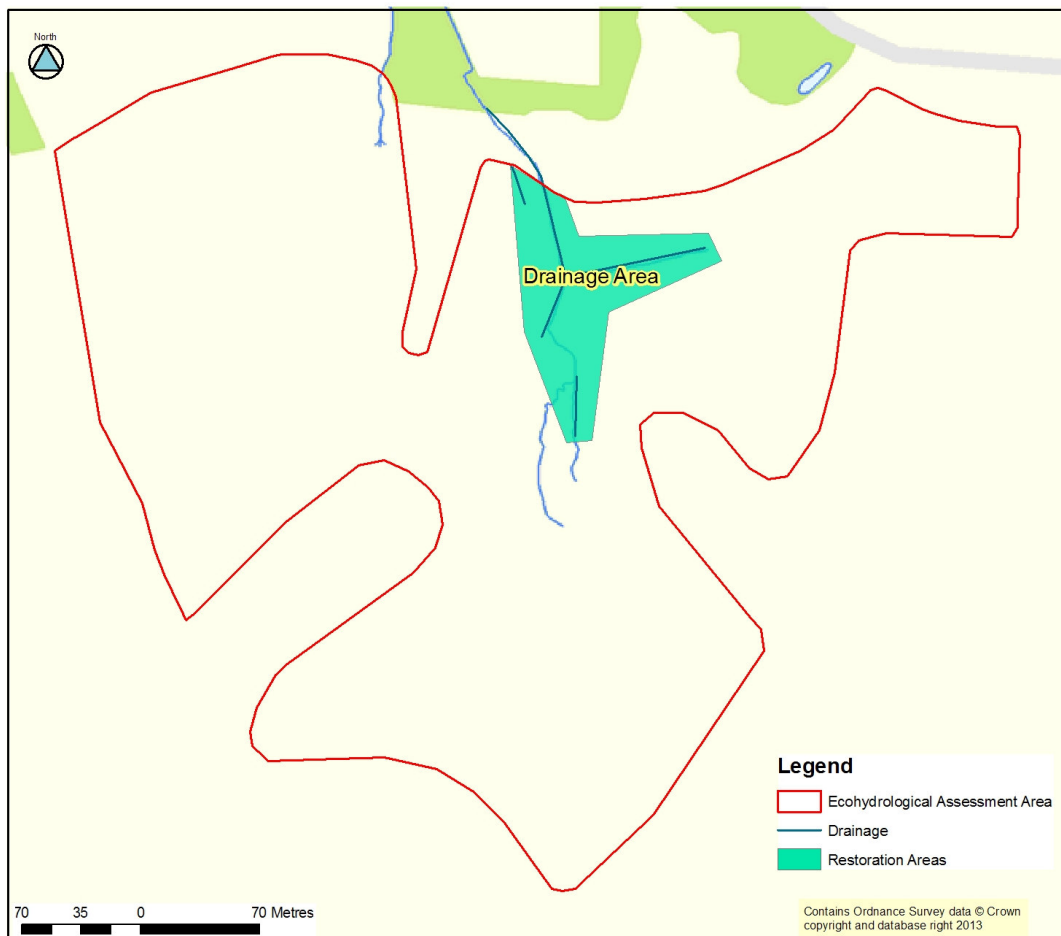
Valley bottom wetland underlain by clay - W16a and W16b.

1.6 Damage and Restoration

1.6.1 Damage

There is one area of significant damage (see Figure 1-6) - the Drainage Area. In this area a series of small drains have been cut draining the wetland area.

Figure 1-6: Restoration Areas Map



The cutting of the drain has resulted in scrub development occurring on the low spoil banks. This consists of Gorse, Silver Birch and Scot's Pine. The effects of drainage have also resulted in a change in the species composition parallel to the ditch where those areas closest to the drain have dried out.

1.6.2 Restoration

The drains in the Drainage Area are small and so could be blocked by a series of regular plugs. The nature of these plugs could vary depending on the materials available locally. In the upper seepage dominated wetland, the underlying sand would not form good material for creating earth bunds.

Removal of scrub from within this unit should be undertaken in combination with drain blocking to remove a seed source and the drying effect of evapo-transpiration from this type of vegetation.

Table 1-3: Restoration Area Summary Table

Restoration Area	Damage Type	Restoration Proposals	Improvement	Constraints and Issues
Drainage Area	Small Drains	Regular plugging	Raising water levels to repair the damaged wetland and restore valley mire habitat	No significant issues
Drainage Area	Scrub encroachment	Scrub removal (Gorse, Silver Birch and Scot's Pine)	In combination with drain plugging above, removal of scrub will prevent further drying and help to restore valley mire habitat	No significant issues

1.7 Monitoring requirements

1.7.1 Water Monitoring

Part of the site is seepage dominated and part is flush dominated. Part of the site is damaged by drainage whilst the majority is intact. A series of boreholes and a small stilling well within the drainage would improve the conceptual understanding of the site and the impacts of past drainage works.

1.7.2 Vegetation

Vegetation composition should be monitored within the eastern valley post-restoration works to ensure that the species composition reverts to those of wetter communities. Ideally these should naturally restore themselves to a M21a valley mire habitat as a result of an increase in groundwater levels.

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)
T	50	Ogdens Mire	Fixed point camera survey Fixed point quadrat survey	6 boreholes and a stilling well (7 installations in total) Plus associated monitoring and processing

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

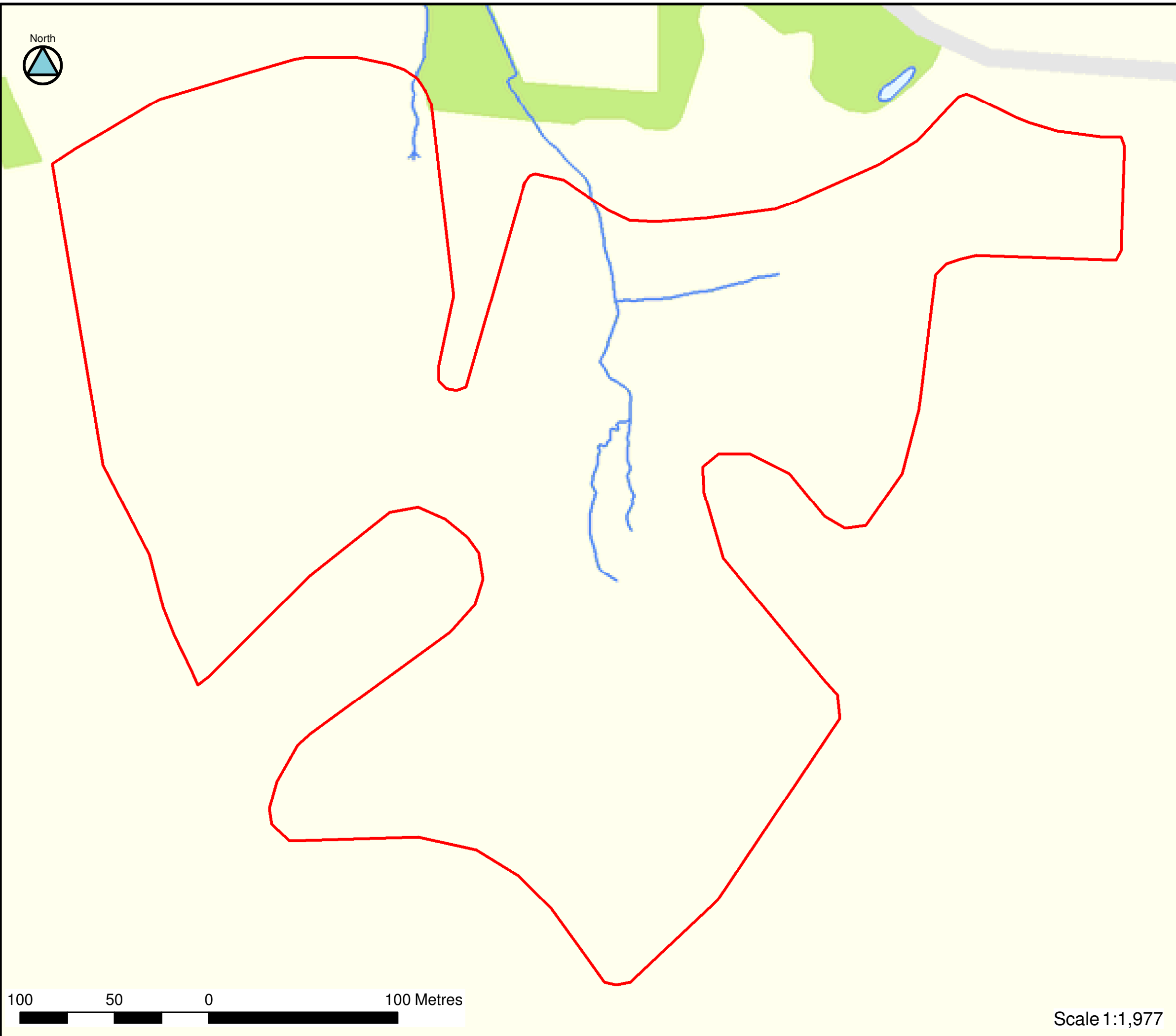
Map 7: Eco-Hydrology Map

Map 8: Restoration Plan



LEGEND

 Ecohydrological Assessment Area



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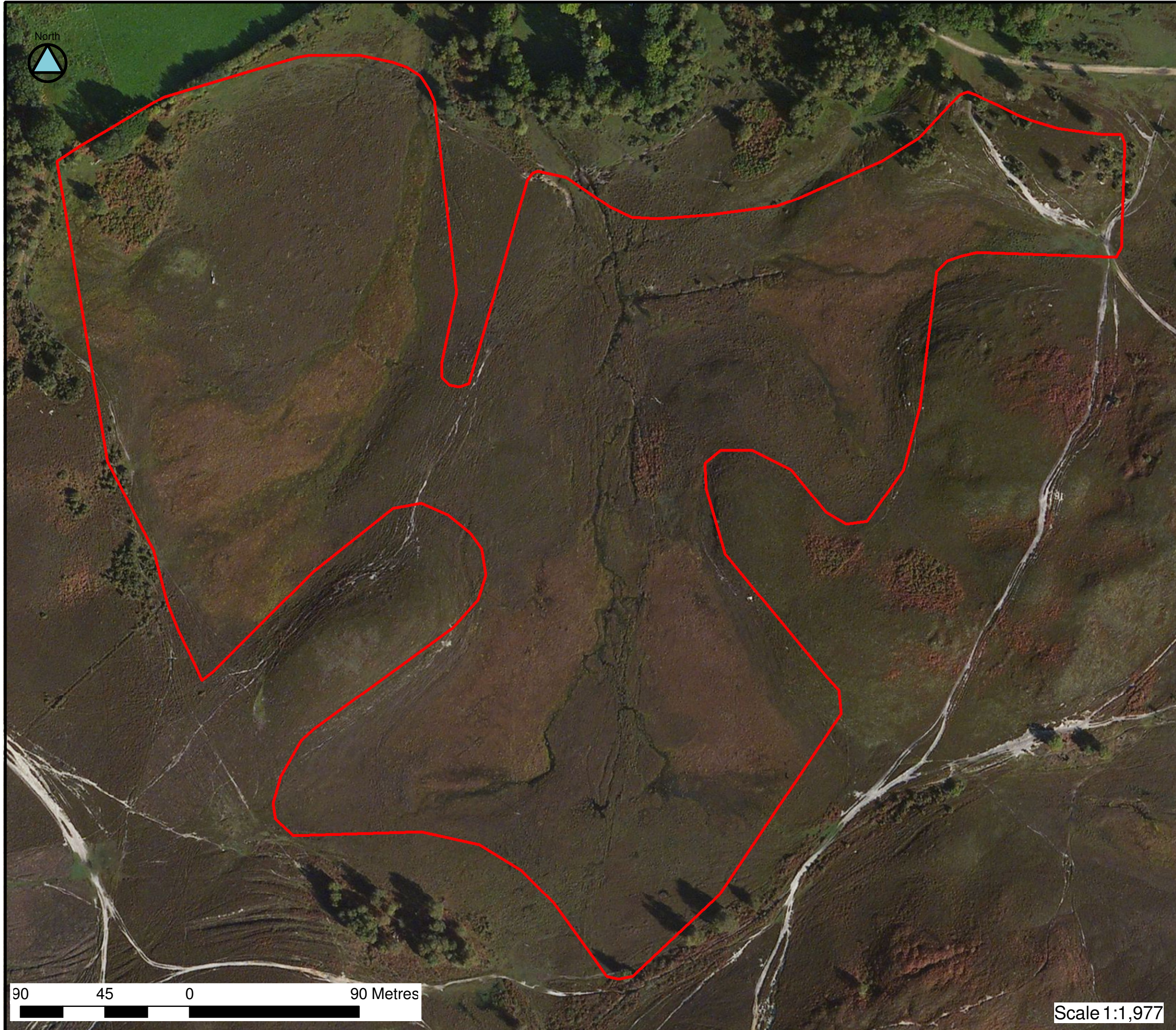


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MAP 1

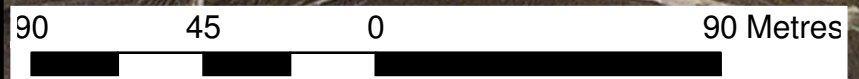
Site Location



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 Ecohydrological Assessment Area

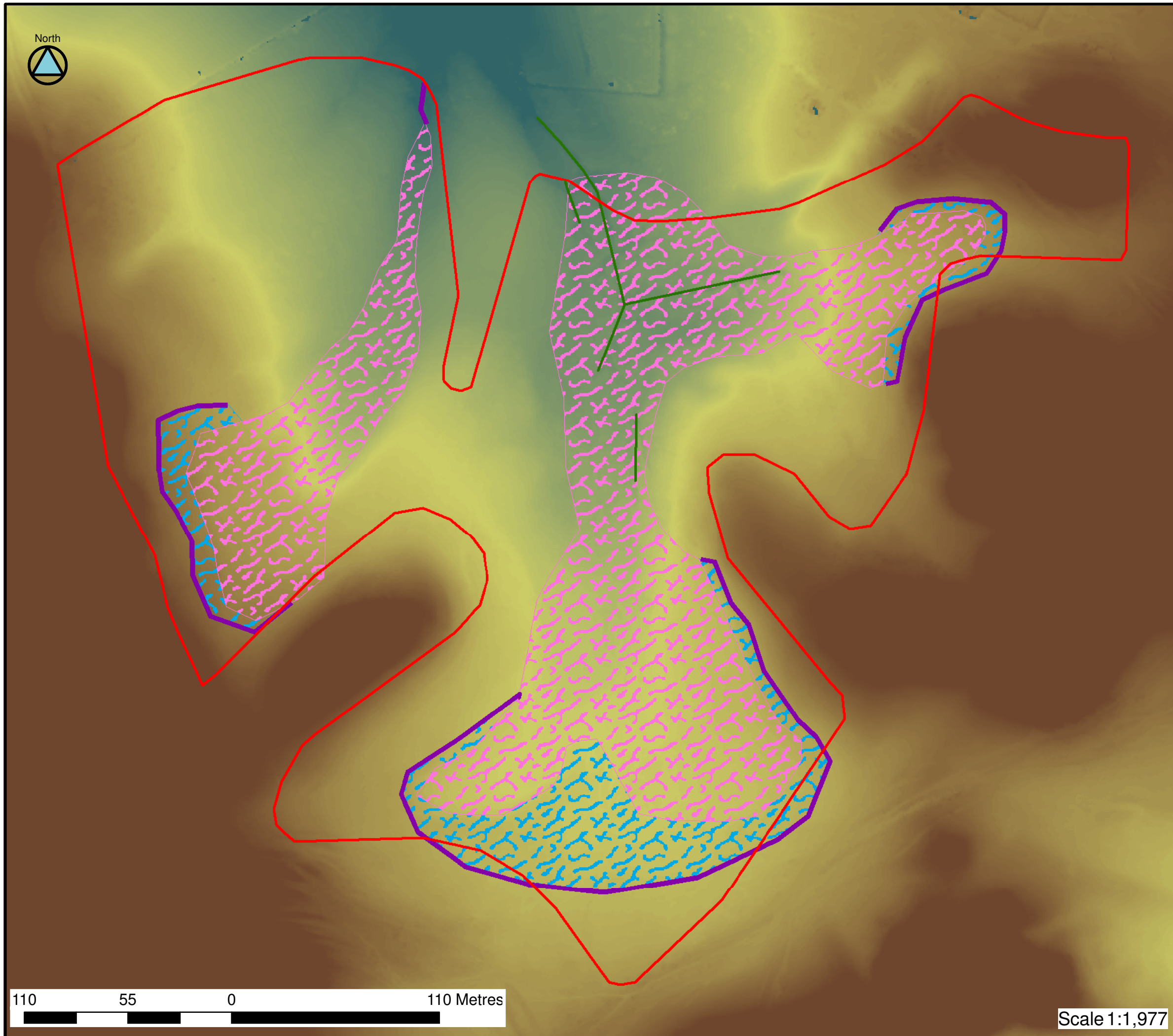
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MAP 2

Aerial Photography

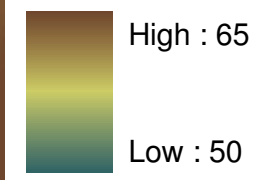


LEGEND

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

LIDAR

mAOD



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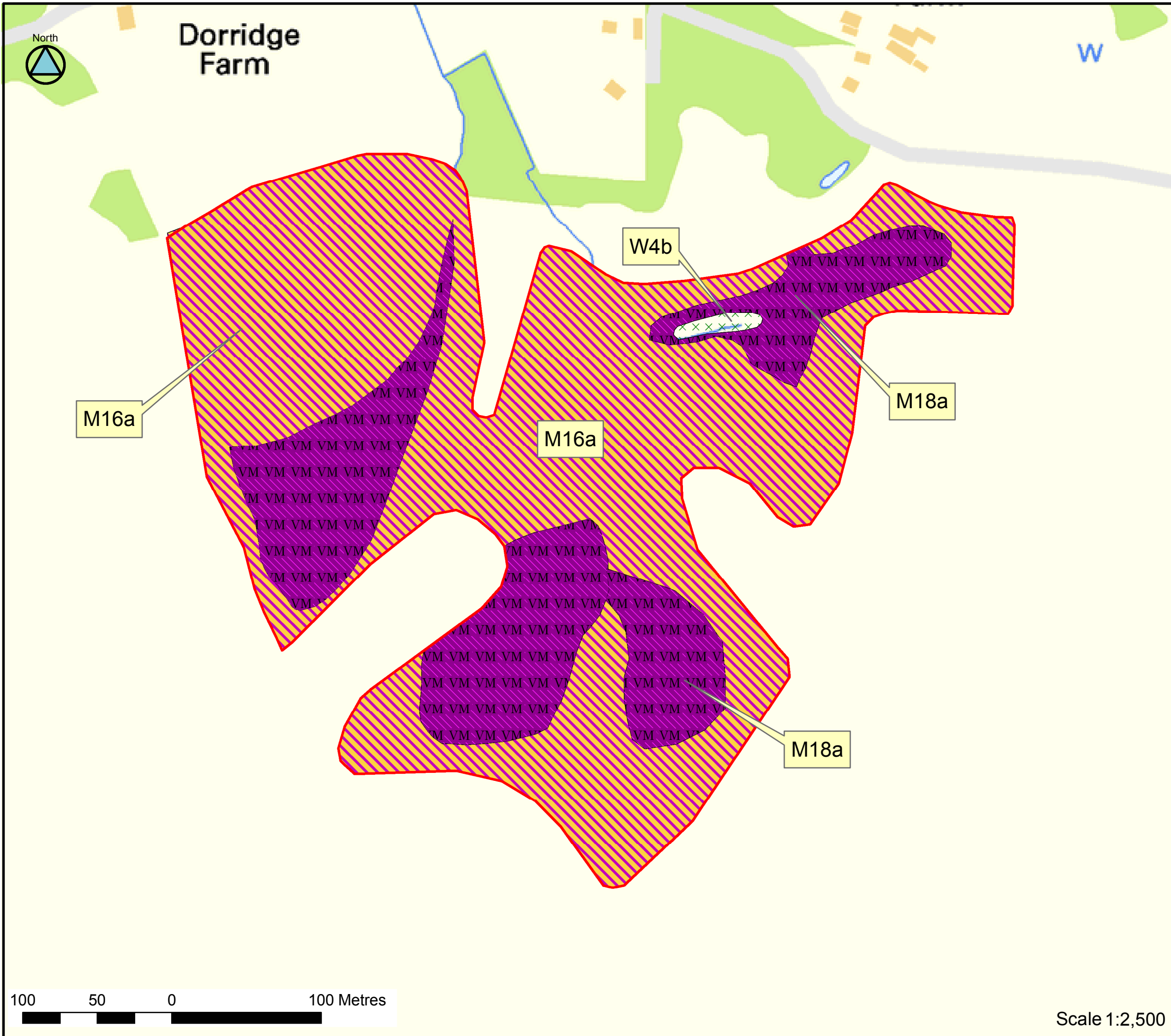


MAP 3








Topography, Hydrology and Wetland Distribution



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LEGEND

-  Ecohydrological Assessment Area
-  Invasives
-  Trees
-  G2.3
- Habitat**
- Habitat_code**
-  A2.2
-  D2
-  E3.1

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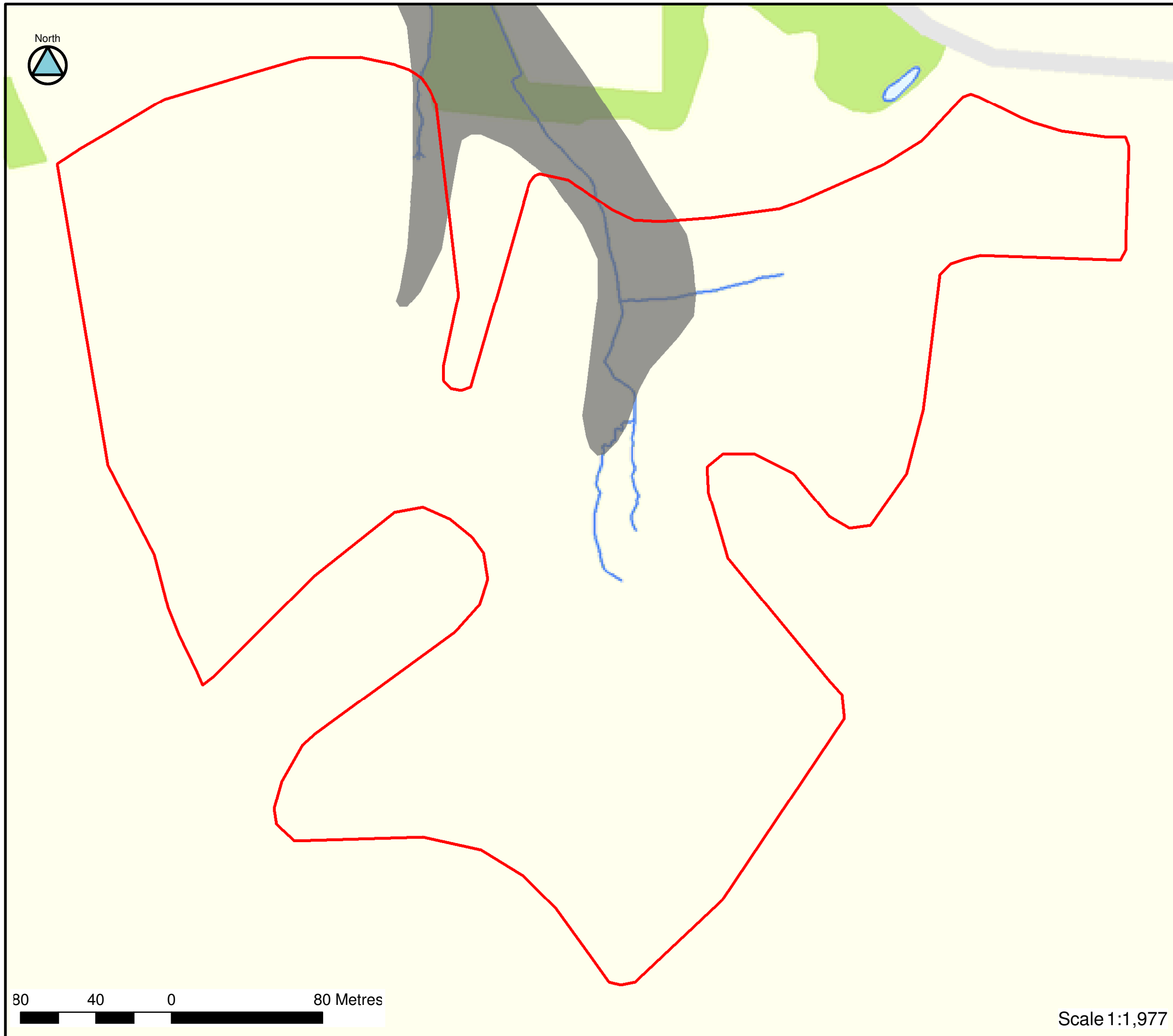


MAP 4

Phase One Habitat



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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

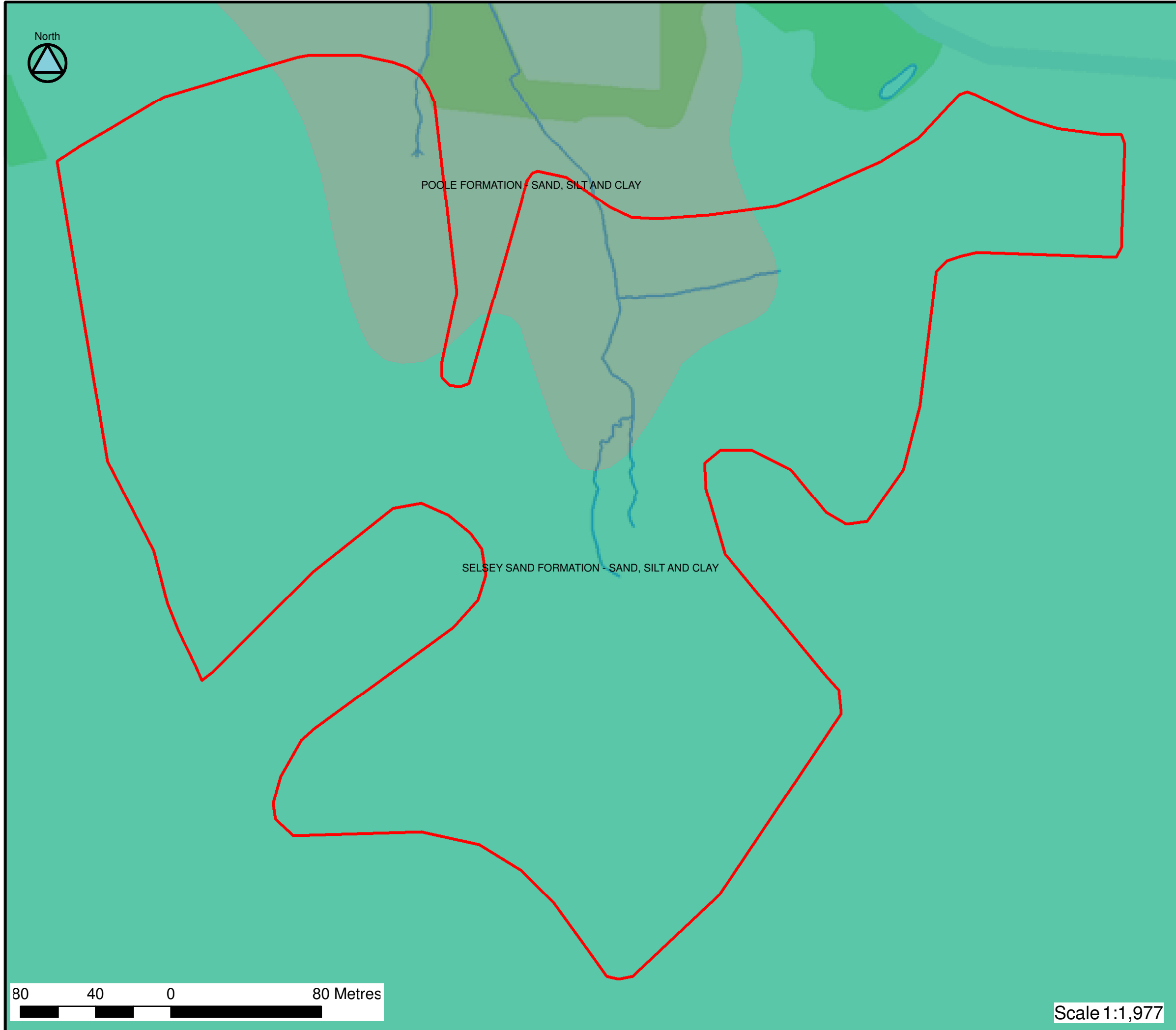
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MAP 5

Drift Geology



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

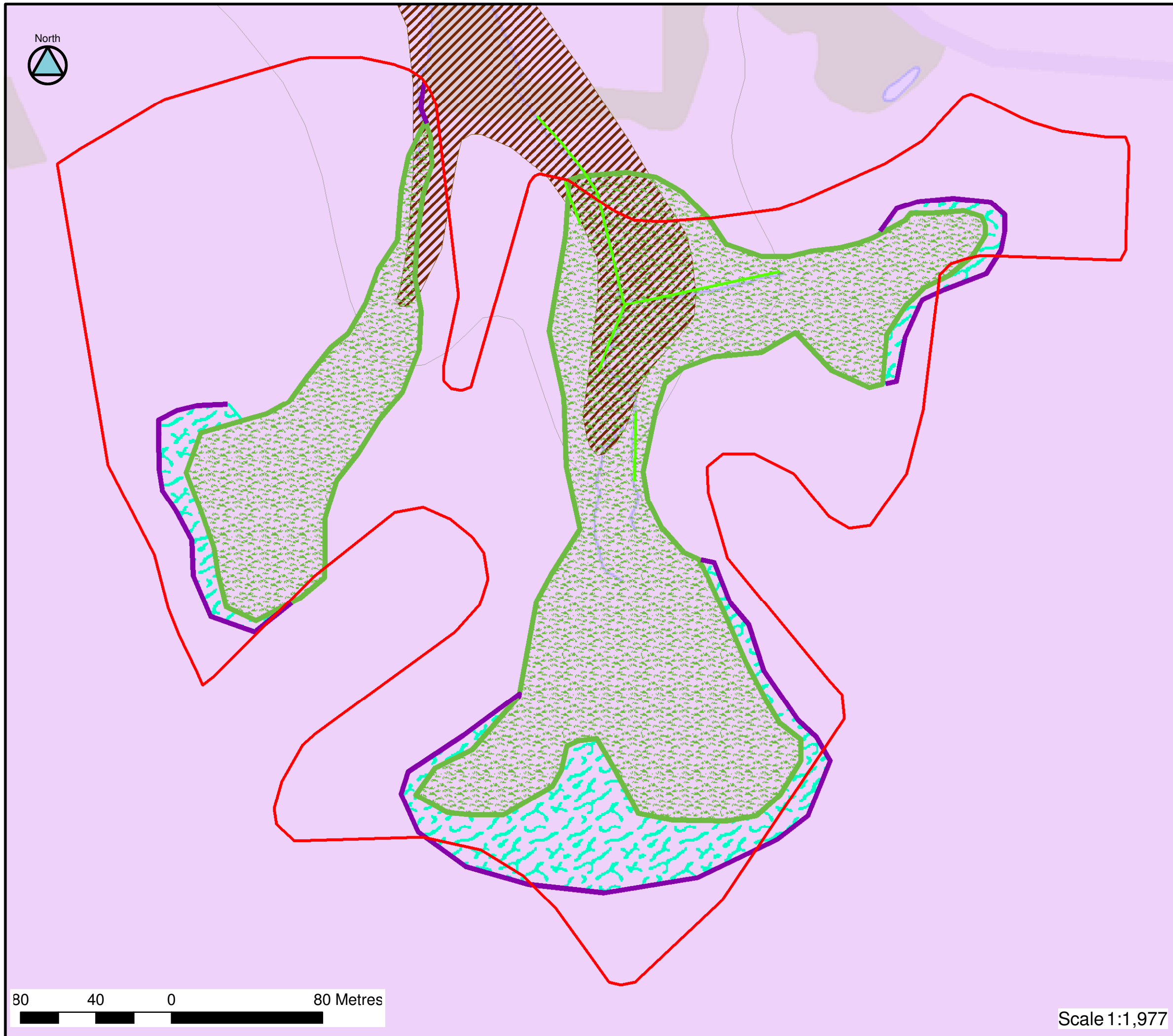
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MAP 6

Bedrock Geology



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

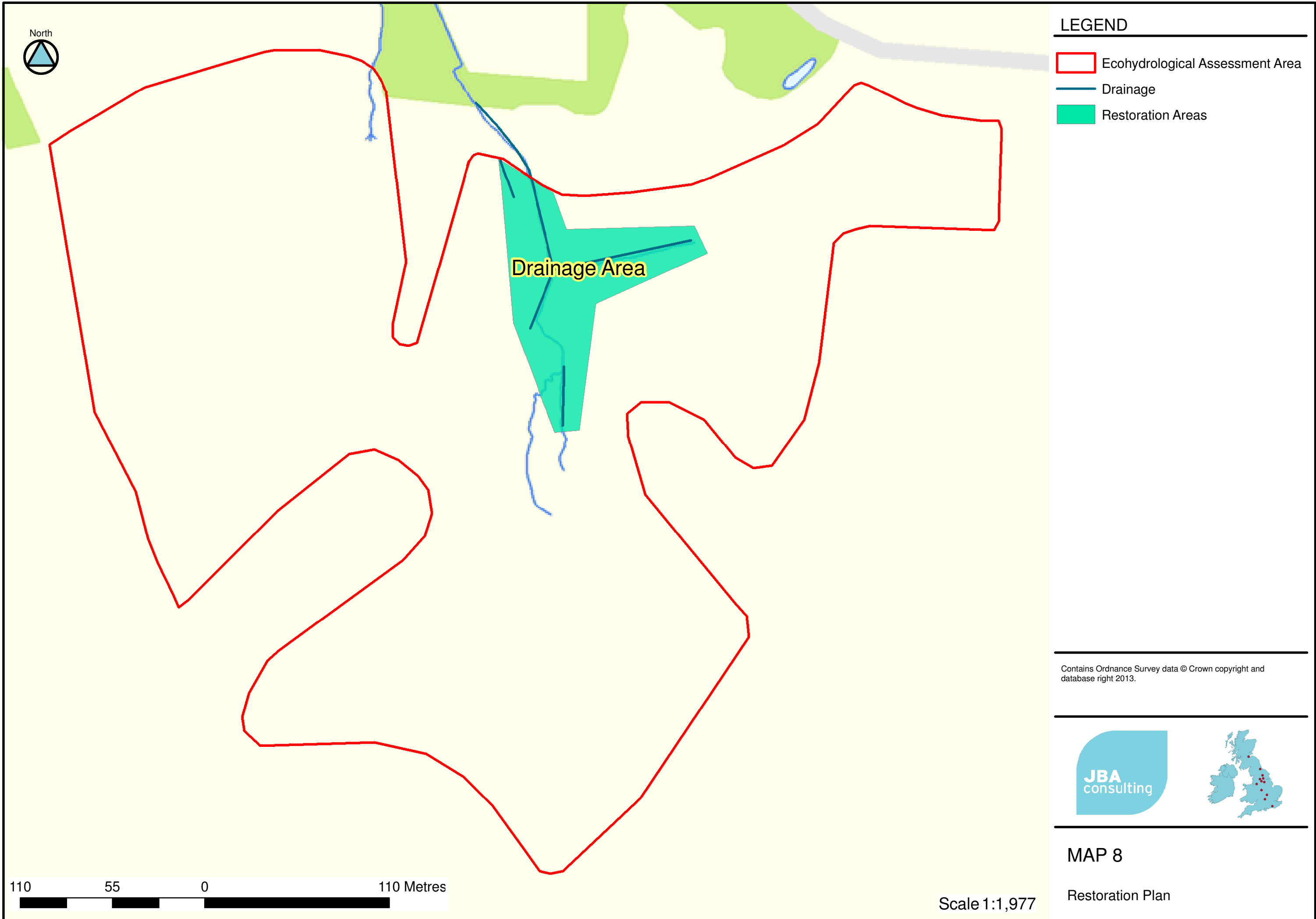
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
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MAP 7

Eco-hydrology



LEGEND

-  Ecohydrological Assessment Area
-  Drainage
-  Restoration Areas

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MAP 8
Restoration Plan

110 55 0 110 Metres

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