

# New Forest SSSI Ecohydrological Survey Overview

## Annex F: Whiteshoot Bottom

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# 1 Whiteshoot Bottom

## 1.1 Introduction

This Ecohydrological Assessment Area (EcoHAA) covers 34.8 ha and is contained within SSSI Unit 129 with its centre at National Grid Reference (NGR) 421207 104673 (see Figure 1-1). Unit 129 is defined as a mire to stream transition unit.

Figure 1-1: Location Map



The site includes mire, swamp and open water habitats, with small pockets of wet woodland, developed within a system of valleys draining south-westwards to Mill Lawn Brook. The wetlands are flush-dominated and fed by groundwater seepage at two distinct stratigraphic horizons: (i) the base of the Becton Sand Formation (where it overlies the lower permeability Chama Sand) and (ii) the base of the Chama Sand Formation (where it overlies the lower permeability Barton Clay Formation). There is little artificial drainage, and the drainage ditches that do exist are not close to the mire areas. However, the site is locally under pressure from grazing, and poaching of the soil by animals is an issue in places. One of the streams draining the area has been artificially straightened close to the downstream edge of the site, but this is not considered to be impacting on the areas of mire habitat.

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

<b>Eco-hydrological Assessment Area</b>		<b>F</b>
Name		Whiteshoot Bottom
Relative Geomorphology Assessment		
Size (ha)		34.8
SSSI Units		129
Valley Side Wetland	Present	Y
	Wetland Type	Flush Dominated
	Main Source of water	Groundwater seepage from (i) the contact between the Becton Sand Formation and underlying Chama Sand Formation (northern part of site) and (ii) the contact between the Chama Sand Formation and underlying Barton Clay Formation (central part of site). There may also be some diffuse seepage from the Chama Sand Formation.
	Indicative NVC communities	M21a, W4b, S4, M24, M16a, W23, H2
	Wetland Types	Mire, Wet Heath, Mesotrophic Standing Water, Swamp, Wet Woodland
	Drainage Damage	N
	Scrub/Tree Encroachment Damage	N
	Poaching and Grazing Pressures Damage	N
Valley Basin Wetland	Present	Y
	Wetland Type	Flush Dominated
	Main Source of water	Groundwater seepage from the contact between the Chama Sand Formation and underlying Barton Clay Formation.
	Indicative NVC communities	M21a, W4b, S4, M24, M16a, W23, H2
	Wetland Types	Mire, Wet Heath, Mesotrophic Standing Water, Swamp, Wet Woodland
	Drainage	Y - artificial modifications to the drainage network: straightening of channels (minor), culverting under road and footpath (minor), "collects" linked to an obviously artificial straight drain at the eastern edge of the site (moderate).
	Scrub/Tree Encroachment Damage	N
Poaching and Grazing Pressures	Y - Grazing pressure is significant around the pond and poaching in places.	
Additional Comments		The presence of a valley centre stream probably explains the near-absence of mire in the southern part of the site (there is a small patch of mire where runoff collects within a poorly-drained depression on the Barton Clay). Recreational pressures were identified as a particular issue on this site with footpath erosion and vehicle rutting.

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 consists of a system of valleys draining south-westwards to Mill Lawn Brook via two distinct sub-parallel watercourses. Mires are developed locally on the valley sides, with swamp and open water habitats occurring in the valley bottom beneath the largest area of mire. In this location, at the foot of the slope, "collects" and ponds feed the watercourses that flow off site.

**Figure 1-2: View over marshy grassland and open water areas towards valley mire and swamp - the break in slope in the background is interpreted as the base of the Chama Sand and a line of groundwater seepage (NGR 421108 104728, looking northwest)**



## 1.3 Ecology

Within the central area of this unit is an area of standing water. The pool is shown on OS maps as two separate waterbodies; however, this has now coalesced into one area of open mesotrophic water. Within this pool there is a relatively good diversity of aquatic macrophytes with Floating Sweet-grass *Glyceria fluitans*, Round-leaved Water-crowfoot *Ranunculus omiophyllus*, Ivy-leaved Crowfoot *Ranunculus hederaceus*, Marsh St. John's-wort *Hypericum elodes*, Sharp-flowered Rush *Juncus acutiflorus*, Bog Pondweed *Potamogeton polygonifolius*, a Water-starwort *Callitriche* sp. and Yellow Water-lily *Nuphar lutea*. There was also a small patch of Common Reedmace *Typha latifolia*. From this pool two watercourses discharge, one flowing in a south-westerly direction and discharging into Mill Brook Lawn at Common Moor and one flowing in a southerly direction and discharging into Mill Lawn Brook near Ward's Plantation. There are also thickets of Grey Willow *Salix cinerea* and Gorse *Ulex europaeus* alongside the stream that flows in a south-westerly direction.

Surrounding the pond is an area of heavily grazed wet grassland, with an extremely short sward. Red Fescue *Festuca rubra*, Purple Moor-grass *Molinia caerulea* and Creeping Bent *Agrostis stolonifera* dominated, with Heather *Calluna vulgaris* and Cross-leaved Heath *Erica tetralix* also present occasionally.

To the north of the pond there is a relatively extensive Common Reed *Phragmites australis*-dominated reedbed which then connects into valley mire habitat with abundant Purple Moor-grass and a number of *Sphagnum* species (e.g. *S. palustre*, *S. papillosum*, *S. capillifolium* ssp. *capillifolium* and *S. denticulatum*). This is bounded by wet heath with abundant Purple Moor-grass, Heather and Cross-leaved Heath, which then grades into dry heath moving upslope with Heather and Bracken *Pteridium aquilinum* dominant, with scattered Gorse.

The stream which flows south into Mill Lawn Brook crosses Forest Road via a culvert. Immediately upstream of this culvert the channel contains a wide variety of species, with significant quantities of Bog Pondweed, Fennel Pondweed *Potamogeton pectinatus*, Floating Club-rush *Isolepis lacustris* and Round-leaved Water-crowfoot.

Recreational pressure was identified as an issue on this site, with several tracks and paths cutting through the wet heath and also a number of flooded vehicle tracks, particularly in the west of the site. Where the footpath crosses the stream in the centre of the site, grazing pressure, poaching and footpath erosion is particularly severe. Also at this location, due to the heavy rain, the stream was out of bank and completely bypassing the culvert over which the footpath crosses; given the extent of poaching and standing water, this is considered to be a regular occurrence, potentially exacerbated by the inadequate size of the culvert.

**Figure 1-3: Extensive footpath erosion and poaching around crossing point (NGR 421175 104605)**



## 1.4 Geomorphology

Two small streams drain the mire areas, flowing south-westwards to Mill Lawn Brook. In general the channels display natural geometries (including meanders), although the southern stream (crossing Burley Moor) has been artificially straightened close to Forest Road. This straightened section is not close to the mire habitats.

## 1.5 Geology and Hydrogeology

Table 1-2 shows the geology at Whiteshoot Bottom.

**Table 1-2: Geology and Hydrogeology**

Age	Group	Formation - member	Description	Thickness	Hydro-geological 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 <sup>3</sup> /d in the south; in the north they rarely exceed 200 m <sup>3</sup> /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
	Barton Group	Barton Clay Formation	Greenish grey to olive grey, glauconitic CLAY; may contain fine-grained sand and shells (mainly bivalves and gastropods).	26 – 80 m	Aquitard	Little useable ground-water

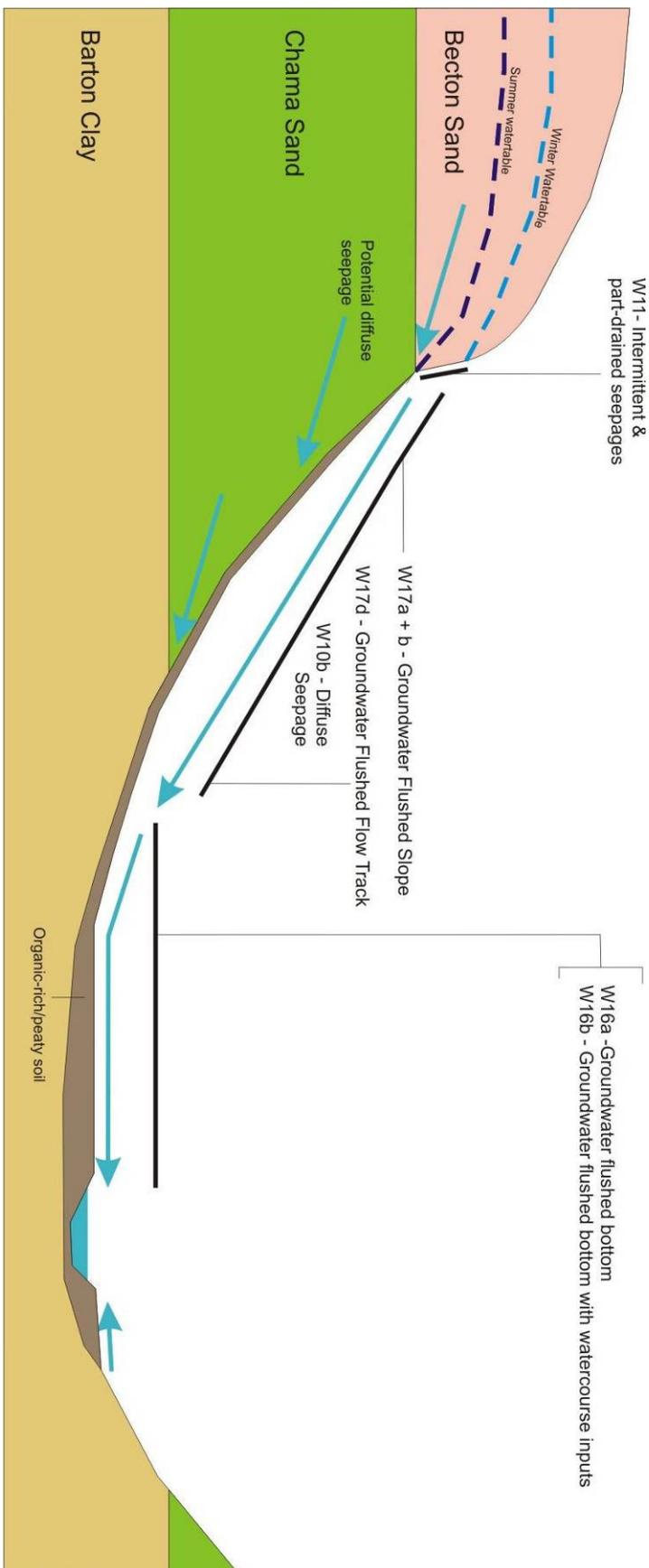
## 1.6 Water Supply Mechanisms

The wetlands on site are flush-dominated (see Figure 1-4). They receive water from groundwater seepage at two distinct stratigraphic horizons, each marked by a permeability contrast: (i) the base of the Becton Sand Formation (where it overlies the lower permeability Chama Sand) and (ii), the base of the Chama Sand Formation (where it overlies the lower

permeability Barton Clay). There may also be some diffuse seepage from the Chama Sand Formation. Water runs over the surface of the low permeability Barton Clay Formation, and gathers in depressions to form ponds and "collects", before flowing away in streams.

Please note that the identified seepage lines do not line up exactly with the 1:50,000 digital geology mapping produced by the British Geological Survey (BGS). This reflects the relatively broad scale nature of the BGS mapping.

Figure 1-4: Conceptual Model Diagram



### 1.6.1 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 - W17a+b and W17d with small areas of W11 above. Also possible W10b.

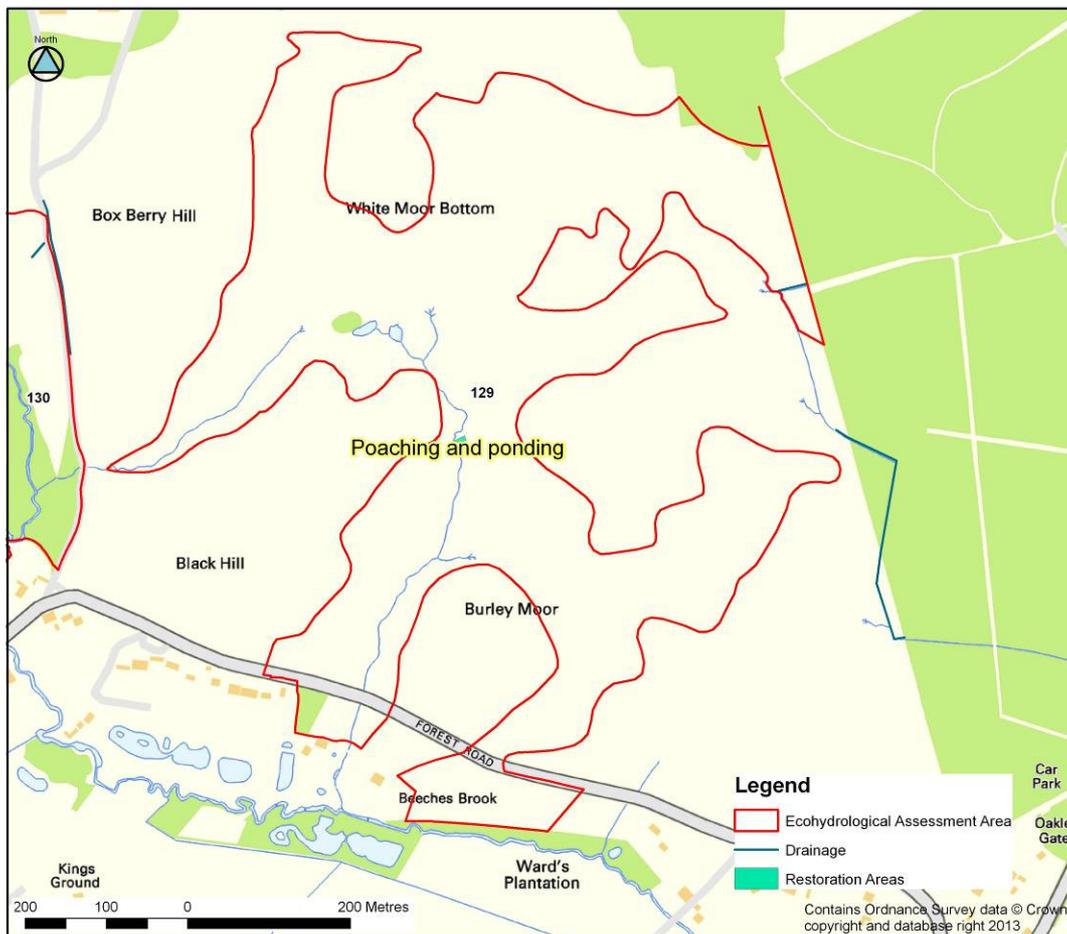
Valley bottom wetlands - W16a and 16b.

## 1.7 Damage and Restoration

### 1.7.1 Damage

There are no areas of significant damage associated with drainage (see Figure 1-5). There has been some artificial straightening of the channel of the stream crossing Burley Moor, but this straightened section is not close to the areas of mire habitat.

Figure 1-5: Restoration Areas Map



Recreational pressures and grazing were identified as having a localised impact, particularly in the centre of the site. Improvements to the culvert (e.g. upsizing or replacement with a boardwalk) at this location should allow water to flow more readily and reduce the localised ponding around the crossing point. This should help to alleviate the poaching and footpath erosion issues.

## 1.7.2 Restoration

**Table 1-3: Restoration Area Summary Table**

Restoration Area	Damage Type	Restoration Proposals	Improvement	Constraints and Issues
Crossing point in centre of unit	Ponding of water around crossing point exacerbated by poaching and recreational pressures	Modification of footpath (e.g. boardwalks) and/or culvert (e.g. upsizing) to remove impediment to flow	Localised restoration of valley mire and wet heath habitats	Footpaths are an important amenity resource which could suffer from short-term disruption

No geomorphological restoration is proposed as the artificial channel straightening described above is minor and is not affecting the mires.

## 1.8 Monitoring requirements

### 1.8.1 Water Monitoring

The site contains mainly flush-dominated wetlands with thin peats or peaty soils - groundwater monitoring is unlikely to be appropriate for such a site. Surface water monitoring is not proposed as there do not seem to be any drainage problems to address.

### 1.8.2 Vegetation

Monitoring of vegetation is recommended to assess the localised area of ponded water around the footpath prior to restoration to ascertain the extent of this problem. Following implementation of restoration measures it is recommended that monitoring is implemented to assess the vegetation communities that redevelop.

**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)
F	129	Whiteshoot Bottom	Fixed point camera survey (specifically focussing on areas where footpaths are impeding flows and footpath erosion/poaching) Fixed point quadrat survey	None proposed

## **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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**MAP 1**

Site Location

210 105 0 210 Metres

Scale 1:3,935



LEGEND

 Ecohydrological Assessment Area

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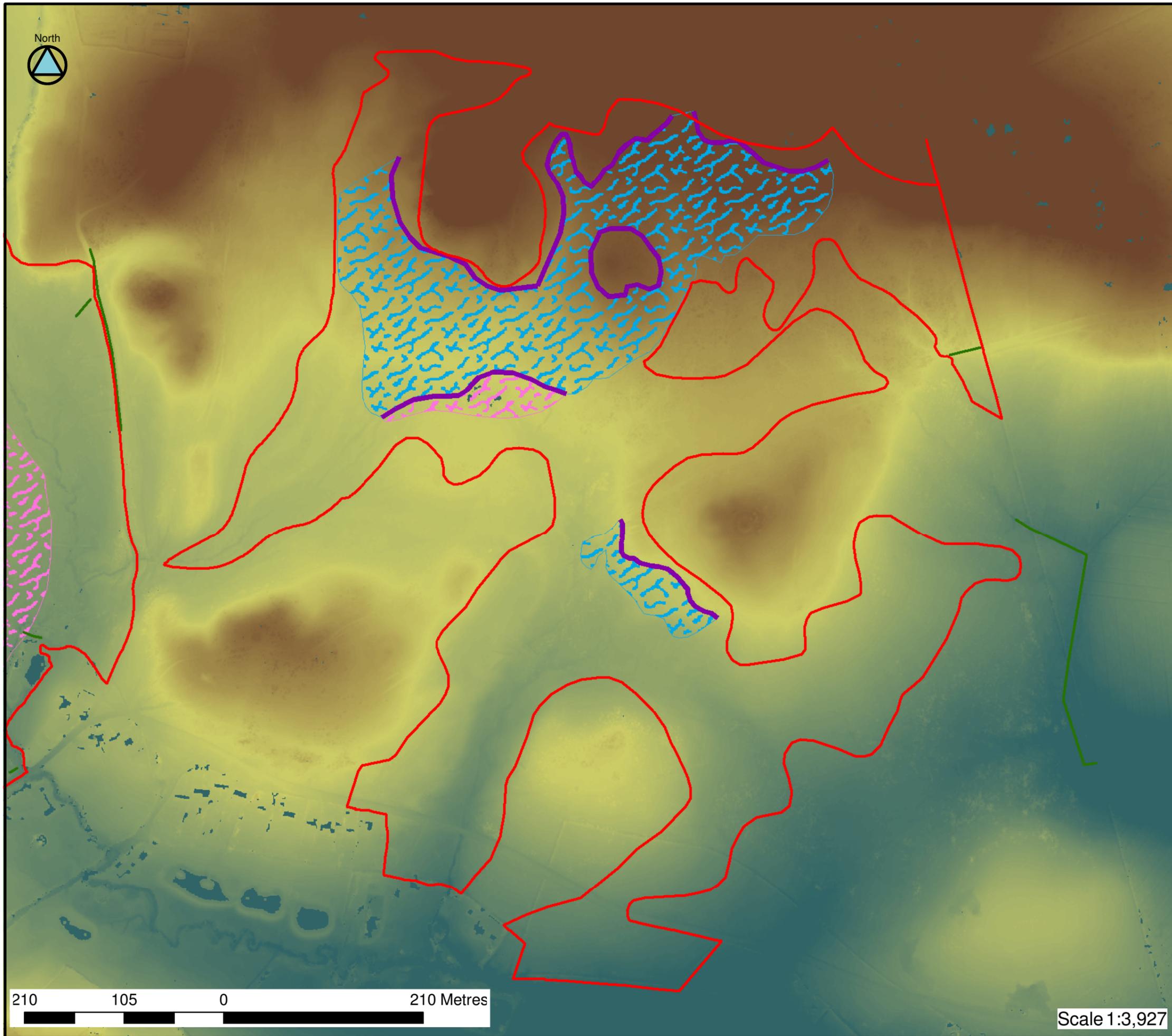


MAP 2

Aerial Photography

200 100 0 200 Metres

Scale 1:3,935

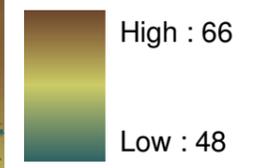


**LEGEND**

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

**LIDAR**

**mAOD**



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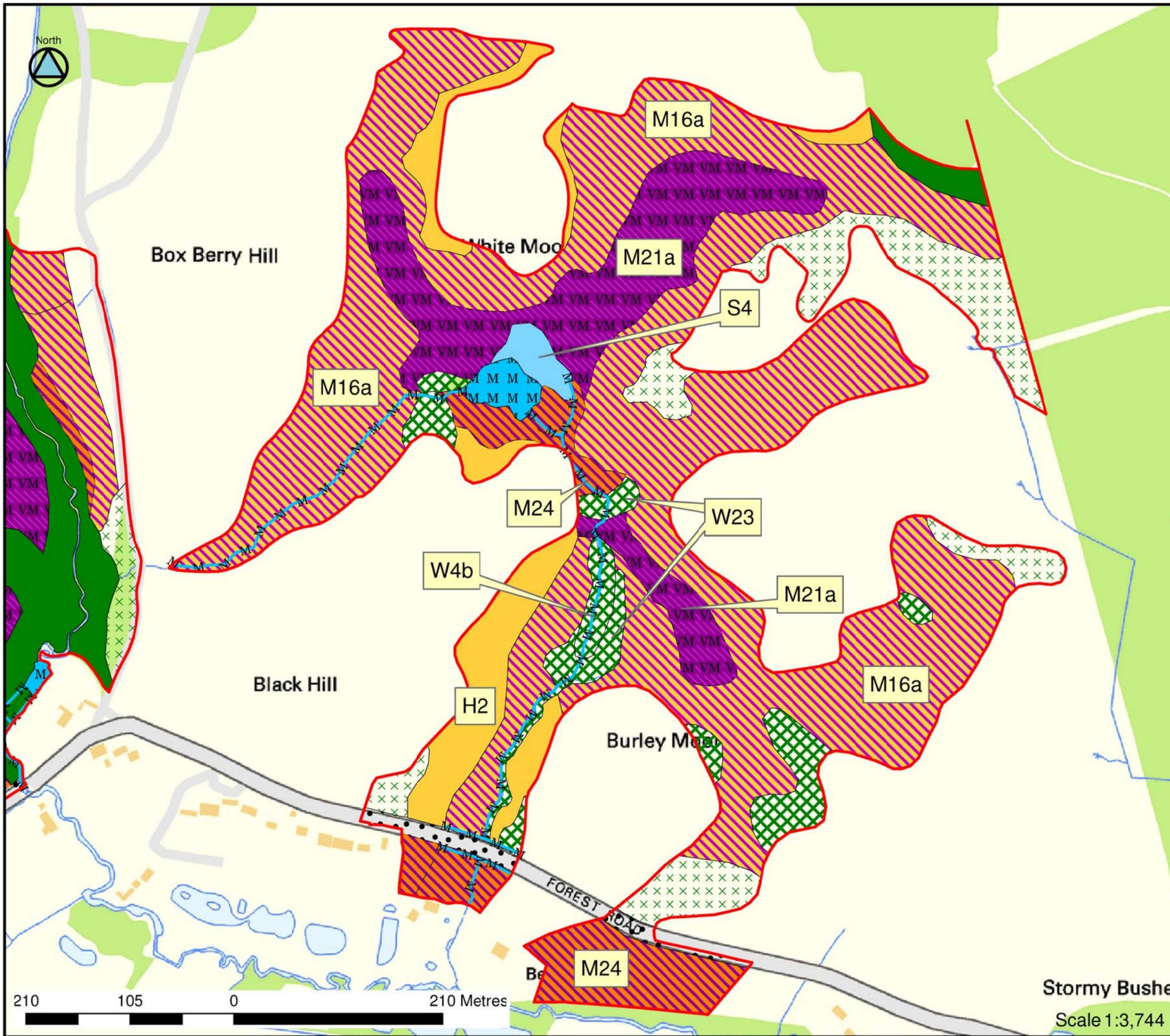


**MAP 3**

Topography, Hydrology and Wetland Distribution



Scale 1:3,927



**LEGEND**

- Ecohydrological Assessment Area
- Habitat**
- Habitat\_code**
- A1.1.1
- A2.1
- A2.2
- B5
- D1.1
- D2
- E3.1
- F1
- G1.2
- J4
- G2.2

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**MAP 4**

Phase One Habitat

**Stormy Buses**  
Scale 1:3,744



**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

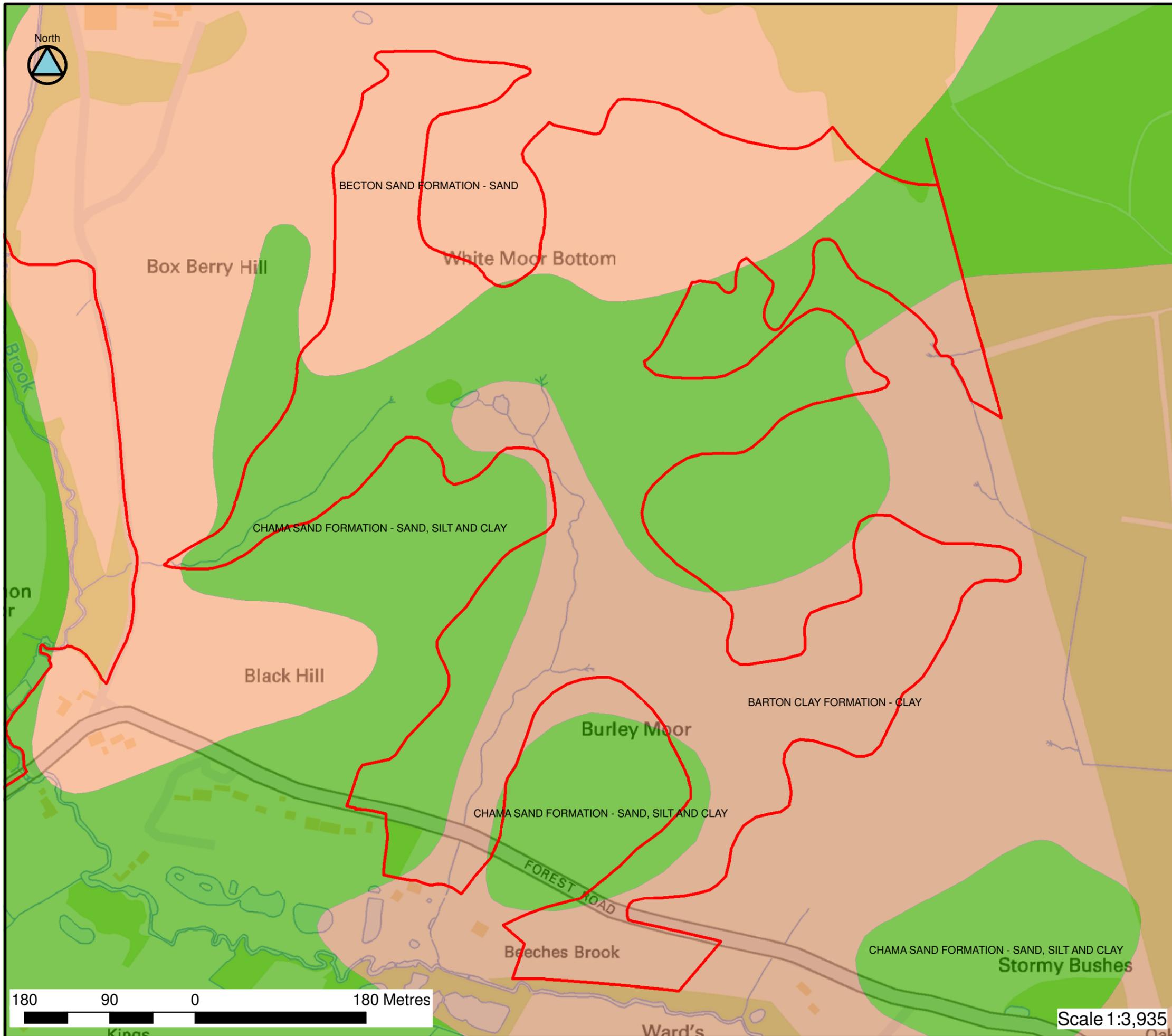
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**MAP 5**  
Drift Geology



Scale 1:3,935



**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

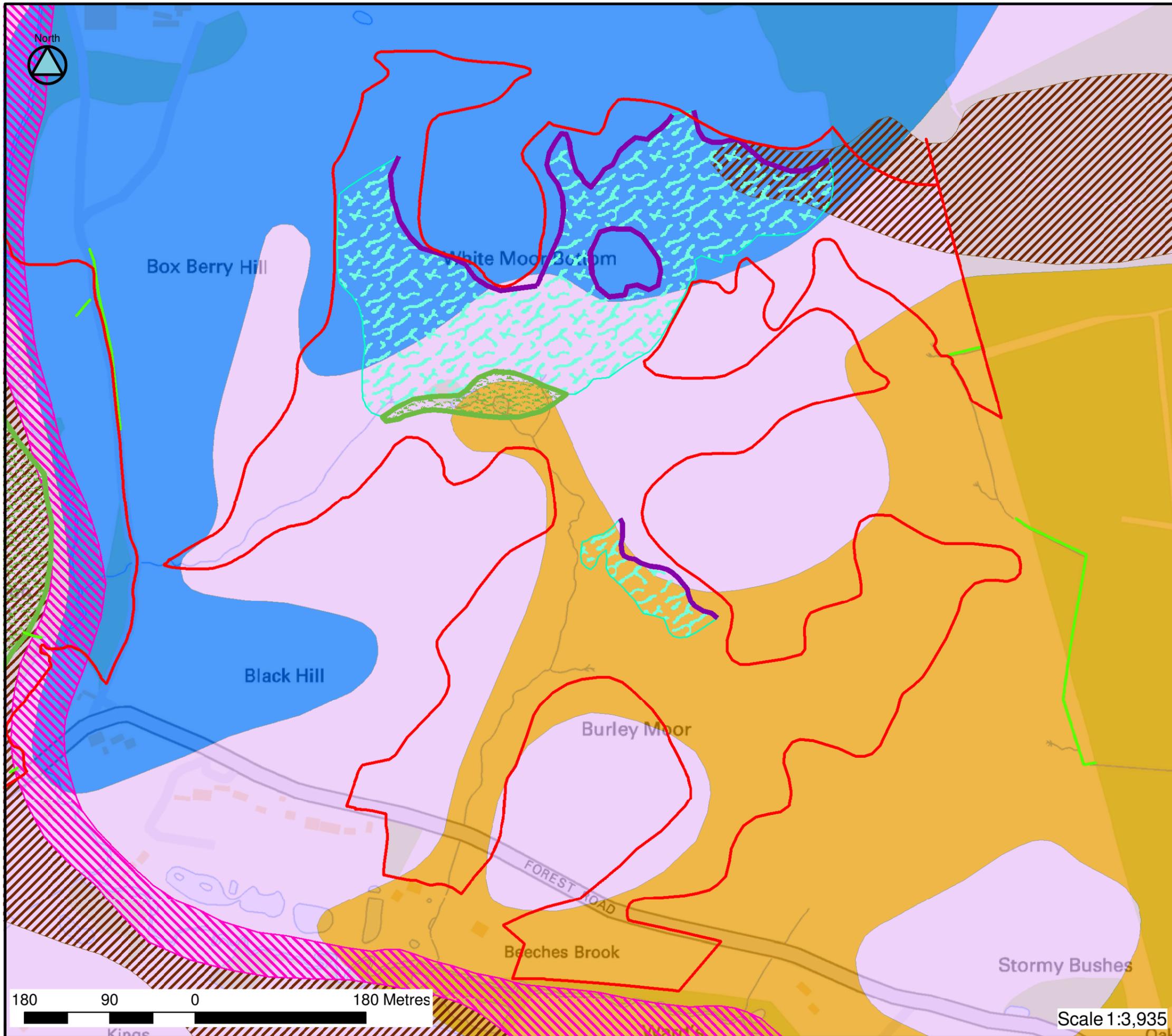
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Scale 1:3,935

**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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**MAP 7**

Eco-hydrology



Scale 1:3,935



**LEGEND**

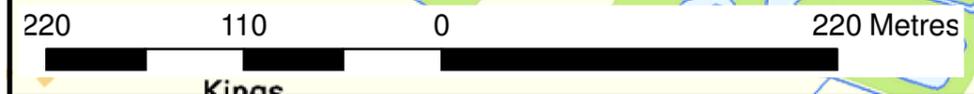
- Ecohydrological Assessment Area
- Drainage
- Restoration Areas

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**MAP 8**  
Restoration Plan



Scale 1:3,935