Natural England Commissioned Report NECR141

New Forest SSSI Ecohydrological Survey Overview

Annex J: Bratley

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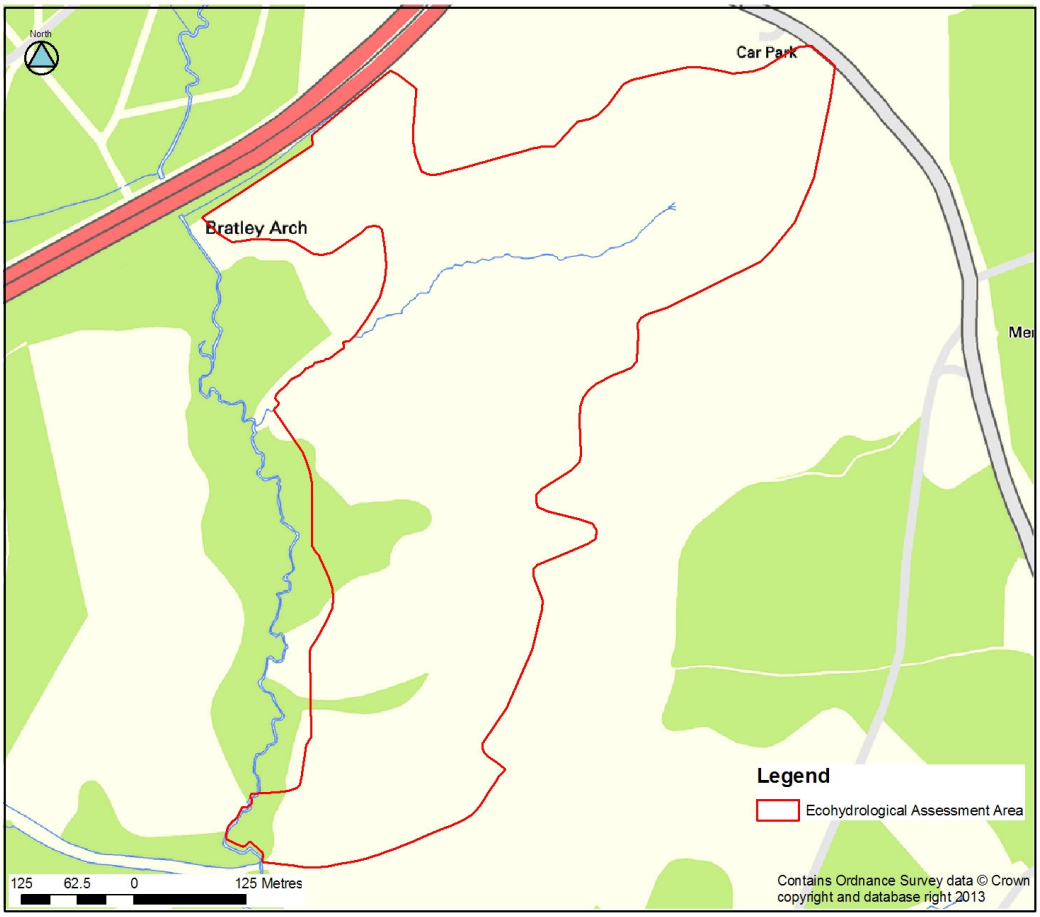
Contents

1 Bratley

1.1 Introduction

This Ecohydrological Assessment Area (EcoHAA) covers 28.5ha and is contained within part of SSSI Unit 341 with its centre at National Grid Reference (NGR) 423393, 109167 (see Figure 1-1).

Figure 1-1: Location Map



The site occupies a valley, broadening into the valley side of Bratley Water. Valley side wetlands are supplied with water from river terrace deposits. These peter out down the slope as water is slowly lost to the ground. In the valley bottom is a small narrow wetland. No artificial drainage was observed on site.

Table 1-1: Bratley Ecohydrological Assessment Area Summary Table

Eco-hydrological Assessment Area		**K**
Name		Bratley
Relative Geomorphology Assessment		
Size (ha)		28.5
SSSI Units		341
Valley Side Wetland	Present	
	Wetland Type	Flush Dominated Wetland
	Main Source of water	Seepage from junction between river terrace deposits/head and Chama sands (aquifer/aquitard) and a lower seepage from Chama sands, Barton clay junction
	Indicative NVC communities	M29, M16a, W4b, M25a, M21a

	Wetland Types	Mire, 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 Wetland
	Main Source of water	Lower seepage from Chama sands, Barton Clay junction
	Indicative NVC communities	M25a, M16a
	Wetland Types	Mire
	Drainage	N
	Scrub/Tree Encroachment Damage	N
	Poaching and Grazing Pressures	N
Additional Comments		Two lines of seepage. The upper one loses water gradually to the Chama Sands and head which means that there is a break between the upper valley side mire and the lower valley side and basin 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, 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 a valley, broadening into the valley side of Bratley Water. Valley bottom is narrow and occupied by a natural stream and wetland fringe. In several locations valley side wetlands occur high up the valley side but these peter out before reaching the valley base.

1.3 Ecology

The Unit has a natural stream running through the centre of it across the wider northern part of the site (Figure 1-1). The site was accessed from Mogshade Hill car park which is located in the north-east of the Unit. The Unit is situated in a valley and, as a result, the initial vegetation encountered at the very north of the site is mainly dense Gorse *Ulex europaeus* scrub which is located here and on the upper valley sides. This forms a 'furze', a common feature of the New Forest that is a product of traditional management in the past.

The Unit as a whole contains several areas of small, discrete valley mire habitats and these arise from a number of widely separated seepage faces scattered around the valley. All of these are disconnected spatially from one another. The first of these mires encountered was near to the car park at Mogshade Hill. A valley mire is present below the seepage face with typical mire-associated species present including Bog Pondweed *Potamogeton polygonifolius*, *Sphagnum spp.*, Purple Moor-grass *Molinia caerulea* and Deergrass *Trichophorum germanicum*. This section of valley mire is only small and soon gives way to wet heath habitat further down the slope, which is dominated by Heather *Calluna vulgaris* and *Molinia* tussocks (Figure 1-2). This habitat is very extensive on this unit and covers all of the slopes below the braes right down to the edges of the mires that occur periodically along the valley bottoms. As mentioned above, the monotony of this habiat is only broken occasionally where there are patches of bog woodland (W4b) usually at the upstream edge of sections of valley mire habitat (M21a).

At the bottom of the valley, water collects naturally, forming a stream. In the middle section of the stream it is surrounded by patches of riparian woodland, of a boggy character (W4b) set within a wider matrix of large *Molinia* tussock grassland.

More valley mire habitat (M21a) is present along the northern and eastern unit boundaries where it is clearly associated with seepage faces. These wetlands then gradually peter-out downstream as the habitat once again reverts to the ubiquitous *Molinia* dominant wet heath mentioned above. The definite changes between wet heath habitat (on slightly higher ground) and valley mire can clearly be seen in Figure 1-3.

The habitats generally within this unit appear pristine and do not appear to have been affected unduly by anthropomorphic activities. Grazing pressures appear to be in balance with the present habitat complexes and do not appear to be having any negative effect on the species composition of the mire communities, either on the valley sides or in the valley bottom. Indeed, in order to maintain the dynamic equilibrium on this site, the levels of grazing should be maintained at their present level to limit scrub and tree invasion.

Figure 1-2: View down seepage face. Valley mire-wet heath habitat (NGR 423751, 109525)

Figure 1-3: View West across the site from its eastern boundary (NGR 423765, 109315)

1.4 Geology and Hydrogeology

Table 1-2 shows the geology at Bratley. The site occupies the edge of a river terrace deposit covered plateau. Head from these deposits have in many places slipped down the valley sides. These overlie the Chama Sand Formation, which form the majority of the valley sides, except in the lower slopes where it is replaced by the Barton Clay formation.

Table 1-2: Geology and Hydrogeology

Age	Group	Formation - member	Description	Thickness	Hydrogeological Role	Water Resources
Quaternary		Alluvium		Up to 10 m	Aquifer / Aquitard	Yields from alluvium and terrace gravels are often obtained from the adjacent rivers.
		Head	CLAY, SILT, SAND and GRAVEL.		Aquifer / Aquitard	
		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	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 groundwater

The River Terrace Deposits, head and Chama Sands form the main important hydrogeological units on the site. The River Terrace Deposits and head are locally gravel-dominated and form aquifers. The Chama Sands is more complex. Local BGS borehole logs (available at http://www.bgs.ac.uk/GeoIndex/) describe the Chama Sands as having multiple layers of silty sand and silty clay, therefore, there are layers that act as aquifers and others as aquitards.

1.5 Water Supply Mechanisms

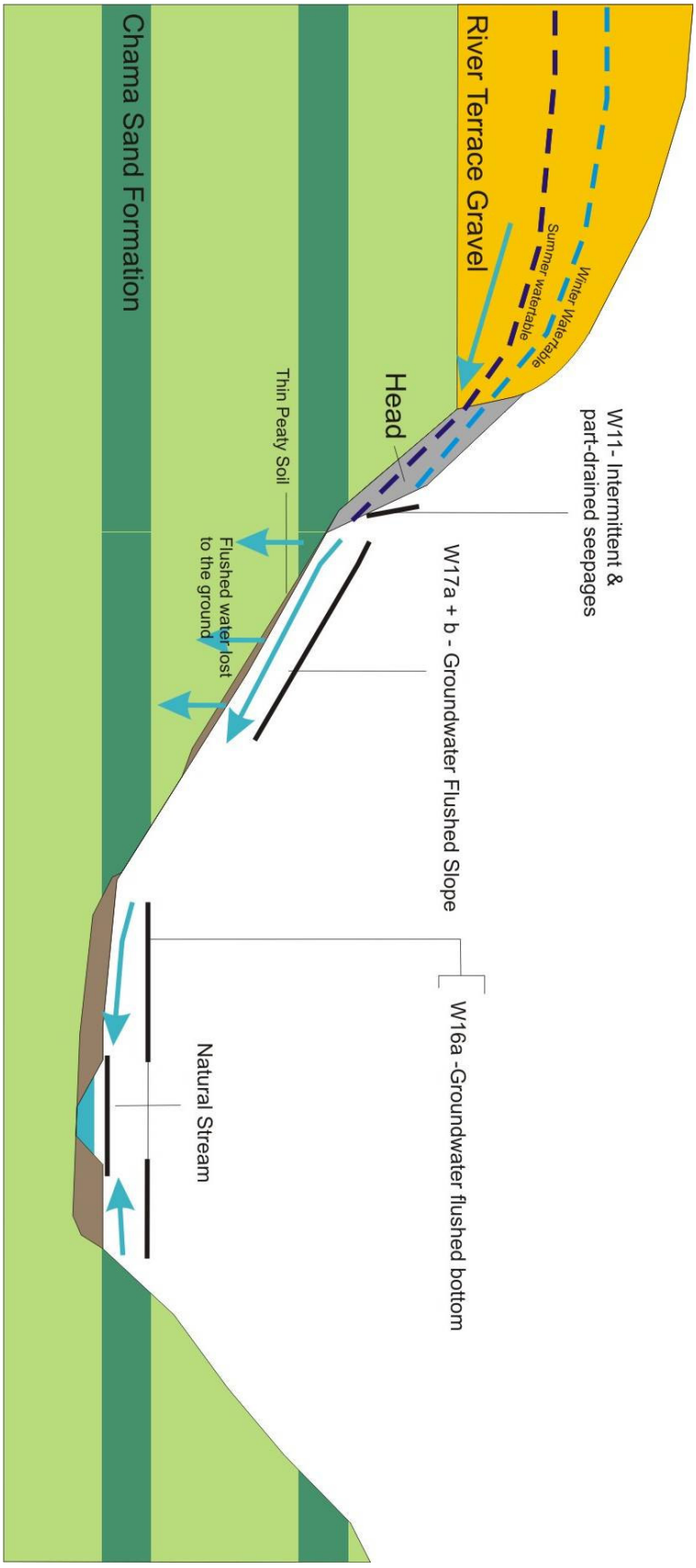
The wetlands on site are flush dominated (see Figure 1-4). The valley side wetlands receive water from a seepage face at the junction between river terrace deposits or head (aquifer) and the underlying Chama Sands Formation. As the flushed water runs over the surface of the Chama Sands (and is some cases lower slope head deposits) it loses water to the more

permeable layers beneath and the valley side wetlands peter out before reaching the valley floor.

A lower seepage face was observed discharging from the Chama Sands, however, it did not seem strong enough to support valley side wetland.

It is unclear whether the valley bottom wetland receives any significant groundwater input from the high permeability Chama Sands layer. However, the main reason why this area is wet is likely to be its topographical nature (i.e. narrow and shallow sloping) which allows it to collect run-off; the water runs over the surface of the low permeability Headon Formation, forming narrow flushed slopes before reaching the shallow valley bottoms.

Figure 1-4: 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 - W17a+b and W17b.

Valley bottom wetland - W16a.

1.6 Damage and Restoration

1.6.1 Damage

There was no hydrological damage observed during the survey, so no specific hydrological restoration measures are recommended.

Gorse scrub encroachment is a minor problem across the site and may need to be monitored in the future to assess if action to control this required, remembering that gorse management is traditional in the New Forest. This should not pose a huge threat to the site in terms of habitat quality and should be relatively simple to implement due to the current small-scale nature of the encroachment observed.

1.7 Monitoring requirements

1.7.1 Water Monitoring

The site contains flush dominated wetlands underlain with thin peats or peaty soils - groundwater monitoring is unlikely to be appropriate for such sites. The surface water features are small and appear stable which limits the need for any monitoring.

1.7.2 Vegetation

Scrub encroachment, in particular from Gorse, has been identified as a possible 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)
K	341	Ma 5 Wet (Bratley)	Fixed point camera survey (to monitor extent of scrub encroachment, focussing on the extent of Gorse) Fixed point quadrat survey	Flush dominated wetland – little peat – no monitoring recommended

2 Maps

North

Car Park

Bratley Arch

Mer

190 95 0 190 Metres

Scale 1:3,638

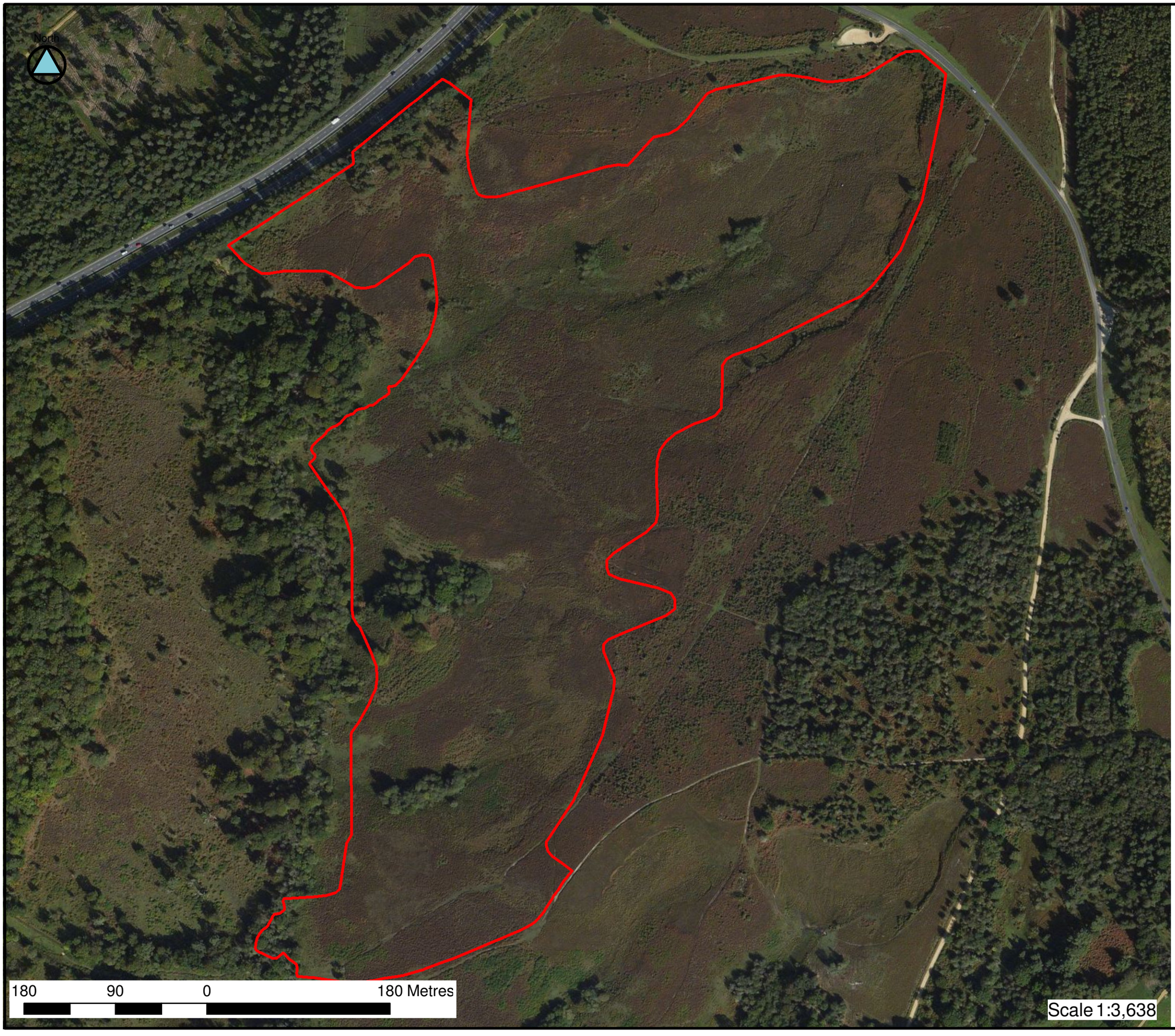
LEGEND

Ecohydrological Assessment Area

JBA consulting

MAP 1

Site Location



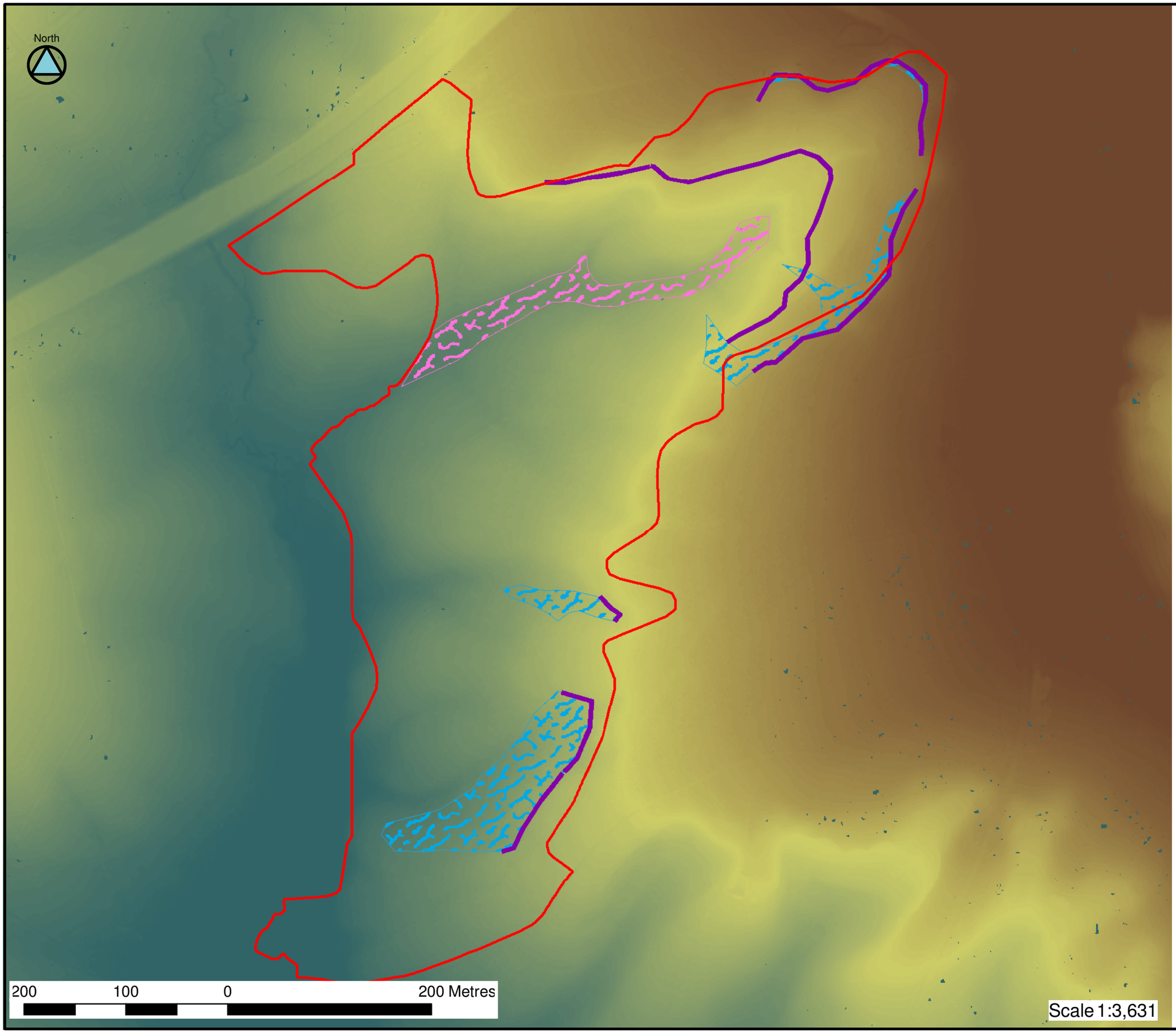
LEGEND

Ecohydrological Assessment Area

JBA consulting

MAP 2

Aerial Photography



LEGEND

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

LIDAR

mAOD

High : 100

Low : 60

Scale 1:3,631

JBA consulting

MAP 3

Topography, Hydrology and Wetland Distribution

North

M16a

Car Park

W4b

M21a

M21a

M16a

M21a

W10b

M29

W23

M21a

170 85 0 170 Metres

Scale 1:3,500

LEGEND

Ecohydrological Assessment Area

G2.3

A1.1.1

A2.1

A2.2

D5

D6

E3.1

E3.2

JBA consulting

MAP 4

Phase One Habitat

North

Car Park

Bratley Arch

Mer

160 80 0 160 Metres

Scale 1:3,638

LEGEND

- Ecohydrological Assessment Area
- No Drift
- Other Deposits
- Alluvium - Clay, Silt, Sand and Grave
- 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

JBA consulting

MAP 5

Drift Geology

North

Car Park

Bratley Arch

BARTON CLAY FORMATION - CLAY

BARTON CLAY FORMATION - CLAY

CHAMA SAND FORMATION - SAND, SILT AND CLAY

CHAMA SAND FORMATION - SAND, SILT AND CLAY

BECTON SAND FORMATION - SAND

HEADON FORMATION - CLAY, SILT AND SAND

160 80 0 160 Metres

Scale 1:3,638

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

JBA consulting

MAP 6

Bedrock Geology

North

Bratley Arch

Car Pa

Mer

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

160 80 0 160 Metres

Scale 1:3,638

JBA consulting

MAP 7

Eco-hydrology

North

Car Park

Bratley Arch

Mer

200 100 0 200 Metres

Scale 1:3,638

LEGEND

Ecohydrological Assessment Area

Drainage

Restoration Areas

JBA consulting

MAP 8

Restoration Plan