

# A1 in Northumberland: Morpeth to Ellingham

**Scheme Number: TR010041**

## **6.7 Environmental Statement – Appendix 9.2 National Vegetation Classification Survey Report**

**Part A**

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Planning Act 2008

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Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning  
(Applications: Prescribed Forms and  
Procedure) Regulations 2009**

**The A1 in Northumberland: Morpeth to Ellingham  
Development Consent Order 20[xx]**

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**Environmental Statement - Appendix**

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# A1 in Northumberland

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National Vegetation Classification (NVC) Survey Report

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A1 in Northumberland  
National Vegetation Classification (NVC) Survey Report

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## EXECUTIVE SUMMARY

This technical report presents the findings of a National Vegetation Classification (NVC) survey undertaken by Jacobs UK Ltd. (Jacobs) on behalf of Highways England. The aim of the survey was to determine the habitat classification(s) applicable to the River Coquet and Coquet Valley Woodlands Site of Special Scientific Interest (SSSI) and to determine the presence or likelihood of protected flora and fauna which may pose constraints upon the proposed upgrade to dual carriageway of the A1 between Morpeth and Felton. The aim of this report is to present the NVC survey information from surveys undertaken on the 18<sup>th</sup> and 19<sup>th</sup> of April 2017 by Jacobs for Highways England. In addition, an indication of the presence of ancient woodland would be provided. Floristic nomenclature follows that of Stace (2010).

The River Coquet and Coquet Valley Woodlands is designated as a SSSI. According to its citation the SSSI is notable for its semi-natural and ancient woodlands and the flora and fauna they support. In addition, the river and stream habitat supports one of the most important game fisheries in the north of England, with large runs of sea trout and salmon. The SSSI is located within the footprint of the preferred option under consideration.

NVC surveys were undertaken based on standard methodology contained in the NVC Users Handbook (Rodwell, 2006). In brief the comprised selecting six homogeneous stands ranging in size from 15 m by 15 m to 40 m by 20 m depending on accessibility were selected within the survey area with 4 m by 4 m random quadrats within these areas surveyed in detail.

When assessed against the NVC woodland descriptive keys, the stands of woodland surveyed were found to be a good fit to *W9 Fraxinus excelsior - Sorbus acuparia - Mercurialis perennis woodland*, typical sub-community, commonly found by streams and flush lines in the uplands.

Of the 10 constant species listed for this community (vascular plants, bryophytes and lichens which are constant species in one or more community of the British National Vegetation Classification system), nine were recorded in the survey area with a total of 59 ground flora species recorded within quadrats.

Nineteen ancient woodland indicators plant species were commonly recorded in quadrats throughout the survey area.

## 1 INTRODUCTION

### 1.1 Scheme Background

1.1.1 Following the outcomes of the 2014 A1 North of Newcastle Feasibility Study, the Department of Transport confirmed in its first Roads Investment Strategy, the intention to upgrade twenty-one kilometres of the existing A1 to a dual carriageway between Morpeth and Ellingham in Northumberland. This comprised two discreet sections:

- Section A - Morpeth to Felton, and;
- Section B - Alnwick to Ellingham.

1.1.2 At this stage (PCF Stage 3) of the project one option is under consideration for Section A; this is briefly described below:

#### Section A - Morpeth to Felton

- Offline Option – this option would be online at its north and south ends, but a large central section would form a new bypass to the west of the existing A1 between the Floodgate Burn crossing and Bockenfield Bridge. The existing A1 would be detrunked and form part of a local road network, which would separate local and strategic traffic.

### 1.2 Report Rationale

1.2.1 The aim of this report is to present the National Vegetation Classification information from surveys undertaken within the River Coquet and Coquet Valley Woodlands Site of Special Scientific Interest (SSSI) in 2017 by Jacobs for Highways England. The River Coquet and Coquet Valley Woodlands SSSI<sup>1</sup> is located within the footprint of the preferred option under consideration. Of note within this site is the likely presence of ancient woodland or ancient woodland indicator species as outlined in the SSSI citation<sup>2</sup>. The full citation can be found in Appendix B.

1.2.2 The phase 1 habitat Survey (Extended Phase 1 Survey Report B2104700/OD/264 - Jacobs 2017) identified the requirement for additional surveys at PCF Stage 3 to determine the presence of sensitive habitats types such as ancient woodland.

1.2.3 Therefore, targeted National Vegetation Classification (NVC) surveys were recommended to determine the plant communities present and provide a framework for subsequent assessment of nature conservation importance of the habitats affected by the preferred option.

1.2.4 The data will ultimately inform the Environmental Impact assessment (EIA) for the preferred option.

### 1.3 Definitions

1.3.1 The study area relates to a 2 km buffer around the proposed options in which desk study information has been collated via online and third party sources.

The survey area refers to a 200 metre buffer either side of the A1 where it crosses the River Coquet and Coquet Valley Woodlands SSSI.

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<sup>1</sup> The River Coquet is an unmodified fast-flowing upland river supporting characteristic fauna and flora. Many of the woodlands near the river are semi-natural and ancient woodland sites, representative of valley woodlands in Northumberland. Citation can be accessed at: <http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s2000052>

<sup>2</sup> <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/2000052.pdf>

## 2 METHODOLOGY

### 2.1 Objectives

2.1.1 The purpose of the NVC survey was:

- to produce an inventory of plant communities within the surveyed area and;
- to determine the presence or likelihood of protected flora and fauna which may pose constraints upon the proposed project and may requiring additional species/habitat-specific surveys.
- provide a basis for developing management options for the surveyed area and as a framework for restoration and design guidelines.

### 2.2 Desk Study

2.2.1 A search of online resources (Magic 2017<sup>3</sup>) was undertaken to obtain ecological information about the survey area. The condition assessment of the 16 units within the River Coquet and Coquet Valley Woodlands SSSI (Natural England 2017<sup>4</sup>) was reviewed against the survey area specific to this report. The location of the SSSI in relation to the NVC survey is illustrated in Figure 1.

### 2.3 Field Survey

#### NVC Survey

2.3.1 Survey methodologies followed standard NVC methodology as detailed in the NVC Users Handbook (Rodwell, 2006). Six woodland stands (A-F), measuring between 40 x 40 m and 15 x 15 m depending on the size of homogenous woodland present, were surveyed. The location of these can be seen on Figures 1 & 2. To the west of stand C, but within the 200m study area, lies a stand of coniferous plantation adjacent to a recently felled plantation. These areas were not included in the NVC survey reported herein.

2.3.2 Within each of the six woodland stands, 3 to 4, 4m x 4m quadrats were used to record the percentage cover of all ground flora including bryophytes (non-vascular plants including liverworts, hornworts and mosses, which lack true stems, roots, or leaves, though they have cells that perform these general functions) and pteridophytes (vascular plants with differentiation into root, stem, and leaves, comprising the ferns, horsetails, and club mosses.). Tables 1 to 6 in Section 3 of this report present the summarized results for each quadrat.

2.3.3 For every canopy and understorey species recorded in the samples, an estimate was made of its quantitative contribution to the vegetation. Cover/abundance is a measure of the vertical projection on to the ground of the extent of the living parts of a species. In the NVC, this is estimated using the Domin scale (sensu Dahl and Hadac 1941). Table 1 below provides Domin values and categories used to determine percentage cover. Table 8 in Section 3 of this report provides a list of ancient woodland indicator species recorded in the survey area.

**Table 1. Domin Values**

Domin Value	% cover
1	<4% Few individuals
2	<4% Several individuals
3	<4% Many individuals

<sup>3</sup> <http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>

<sup>4</sup> <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000052&SiteName=COQUET&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=>



Domin Value	% cover
4	4-10%
5	11-25
6	26-33
7	34-50
8	51-75
9	76-90
10	91-100

2.3.4 The survey results were assessed using the NVC Woodland descriptive keys (Hall et al, 2004) to identify the best fit vegetative communities for the woodland stands studied. Each stand was mapped to NVC community or sub-community level using standard NVC coding (e.g. W1 *Salix cinerea* – *Galium palustre* woodland).

DOMIN values were not apportioned to the ground layer species as this is not necessary to determine woodland communities' classification in addition it can be a lengthy process with limited input to the outcome of the assessment. Such detailed analysis would only be considered appropriate as part of an extended monitoring programme for example, where recording of small changes in cover over time were required to determine if habitat management was having the desired effect. Ground layer species were recorded in each quadrat and ancient woodland indicator species identified as set out by Rose, 2006 for lowland Northumberland (see Table 8 for summary details).

2.3.5 The term frequency is used to describe how often a species is encountered in different stands or samples of a vegetation type, irrespective of how much of that species is present in each stand or sample. Typically for NVC surveys, these are summarised in floristic tables using the Roman numerals I–V and referred to in descriptions of vegetation types using the following: Frequency class I = 1–20% (i.e. 1 stand in 5), scarce II = 21–40%, occasional III = 41–60%, frequent IV = 61–80% and constant V = 81–100%. For brevity however, only where the frequency class of any given ground flora was assessed as constant, i.e. 61 – 100% was this noted within the results tables for each woodland stand.

2.3.6 Analysing all the cover values recorded is a very lengthy and in this instance was unnecessary in determining the woodland communities' classification. Such detailed analysis would be considered appropriate as part of a meadow monitoring programme for example, where recording of small changes in cover over time were required to determine if habitat management was having the desired effect. In this case sufficiently detailed information has been recorded such that if a comparison was required in the future following impacts from the scheme, the survey can be replicated and the two sets of data analysed.

2.3.7 For the purposes of this report protected species are considered to comprise plant species afforded legal protection. These include plants protected by relevant Schedules of the Habitat Regulations 2017 (as amended), Wildlife and Countryside Act 1981 (as amended) and species and habitats listed on Section 41 of the NERC Act 2006.

### Limitations

2.3.8 The surveys were undertaken at an optimal time of year and were unhampered by access restrictions. The results are therefore considered appropriately robust.

2.3.9 The findings of this report represent the professional opinion of qualified ecologists and do not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this document. Should there be a delay in the proposed project programme, it is considered prudent that the survey findings be reviewed and updated as required to ensure that the assessment of ecological impacts is undertaken against an accurate baseline.

2.3.10 To minimise the likelihood of adverse effects on protected plant species, it is accepted good practice to repeat surveys should a significant period of time lapse between the initial survey

visit and works commencing. If the works are not undertaken within a year of this report, a repeat survey may be necessary and should be carried out by an appropriately experienced ecologist who is fully informed of all previous survey work carried out on the site.

- 2.3.11 If the work proposals are altered to include use of additional areas (e.g. for the purposes of access or materials storage) assessment in relation to important habitats and protected species in these areas would also be required.

## 3 BASELINE

### 3.1 Site Description

- 3.1.1 In the survey area the sections of wooded banks of the River Coquet valley are very steep with rocky outcrops. This is more evident to the east of the A1 both on the north and south side of the river. The steepest gradients are generally at the top of the slope with gradients decreasing lower down towards the river. These lower slopes generally support deeper moist soils or in places, large boulders from previous rock falls which have been colonised by mosses and ferns.
- 3.1.2 Along the drier slope towards the top of the river valley, footpaths are present bordered by mature *Quercus spp.* and *Fagus spp.*, species which are less common elsewhere within the woodland. Similarly, a number of herbs found here are less abundant within the lower woodland. These include sanicle (*Sanicula europaea*), woodruff (*Galium odoratum*), moschatel (*Adoxa moschatellina*), goldilocks buttercup (*Ranunculus auricomus*), wood sage (*Teucrium scorodonia*) and pignut (*Conopodium majus*). (*Alnus glutinosa*) with localised Willow (*Salix spp.*) were present along the river banks.

### 3.2 Data Search

- 3.2.1 SSSI unit 13; Duke's Bank Wood, which lies to the south of the River Coquet where it is crossed by the A1, encompasses stands D, E & F. This woodland feature has been assessed as in "favourable" condition (Natural England 2017) as all the targets set in the favourable condition tables (FCT) were being met.
- 3.2.2 The SSSI condition assessment reports that: 95% of the species are native with abundant sycamore (*Acer pseudoplatanus*) with small numbers of exotic [sic] (Douglas Fir (*Pseudotsuga menziesii*) and Sitka Spruce (*Picea stichensis*)) and species such as sweet chestnut (*Castanea sativa*). These were not present as seedlings or saplings. Much of the woodland was single age, due to clear-felling within part of the site and dead wood, both standing and fallen is abundant. A handful of planted beech are present. Regeneration potential was assessed as good with basal sprouting of alder but tree seedlings were somewhat scarce due to moderate deer browsing. Over 80% of the ground flora was deemed typical of W7 and W9 woodlands.
- 3.2.3 The boundary of the SSSI encompasses the River Coquet and habitats to the south of this. Areas surveyed within Mill Banks north of the river do not fall within the SSSI boundary.

### 3.3 Survey Results

- 3.3.1 Duke's Bank Wood to the south of the River Coquet and Mill Banks to the north, encompassed the woodland which was included in the NVC survey. These woodlands were dominated by sycamore closely followed by ash (*Fraxinus excelsior*) with frequent wych elm (*Ulmus glabra*), occasional rowan (*Sorbus aucuparia*), sessile oak (*Quercus petraea*) and less so pedunculate oak (*Q. robur*) and localised silver birch (*Betula pendula*) and downy birch (*Betula pubescens*). The understory, which was not densely vegetated, predominantly comprises hazel (*Corylus avellana*), followed by hawthorn (*Crataegus monogyna*) and English elm (*Ulmus procera*) with saplings of the canopy trees, localised holly (*Ilex aquifolium*) and a small area of bird cherry (*Prunus padus*) in stand E.
- 3.3.2 The ground flora shows more variation than the canopy, however, as it mirrors the varying ground conditions. The six stands surveyed in more detail were selected based on ground flora variation observed in the field. Each stand is described in more detail in Tables 2 – 7 in this section of the following sections of this report.
- 3.3.3 Ground flora diversity within the six stands varied from 42 species recorded in stand A (Table 2) to only 19 species recorded in stand F (Table 7). Less diverse areas are typically

dominated by a small number of species such as common woodrush (*Luzula multiflora*) or ramsons (*Allium ursinum*) which typically outcompete other species and reduce the bryophyte cover. Many quadrats had over 50 % cover of bryophytes. Throughout all stands dog's mercury (*Mercurialis perennis*), wood anemone (*Anemone nemorosa*), broad buckler-fern (*Dryopteris dilatata*) and rough-stalked feather moss (*Brachythecium rutabulum*) were categorised as constant with Borrer's scaly male-fern (*Dryopteris borreeri*), lesser celandine (*Ranunculus ficaria*) and common tamarisk-moss (*Thuidium tamariscinum*) categorised as frequent.

3.3.4 Survey results for each stand are presented in Tables 2 – 7 below. A complete list common species names is provided in Appendix A.

**Table 2: Stand A Quadrats**

4 x 4m ground flora 20 m x 40 m canopy	A1	A2	A3	A4	Domin Category
<b>Grid ref</b>	NZ17611 99924	NZ17599 99920	NZ17597 99927	NZ17623 99916	
<b>Aspect</b> – South facing					
<b>Location</b> - North side of river Coquet, East of A1					
<b>Canopy (20 m)</b>					
<i>Acer pseudoplatanus</i>					8
<i>Fraxinus excelsior</i>					5
<i>Betula pendula</i>					1
<i>Quercus petraea</i>					3
<b>Understory (5-10 m)</b>					
<i>Corylus avellana</i>					5
<i>Fraxinus excelsior</i> (saplings)					2
<i>Acer pseudoplatanus</i> (saplings)					2
<i>Ilex aquifolium</i>					1
<i>Crataegus monogyna</i>					3
<b>Ground flora (20 cm)</b>					
<i>Ajuga reptans</i>			✓		
<i>Anemone nemorosa</i>	✓	✓	✓	✓	Constant
<i>Athyrium filix-femina</i>	✓		✓	✓	Constant
<i>Blechnum spicant</i>				✓	
<i>Brachypodium sylvaticum</i>	✓	✓			
<i>Carex pendula</i>				✓	
<i>Chrysosplenium oppositifolium</i>			✓		
<i>Crataegus monogyna</i> (seedling)				✓	
<i>Deschampsia cespitosa</i>	✓		✓		
<i>Dryopteris borreeri</i>	✓	✓	✓	✓	Constant
<i>Dryopteris carthusiana</i>			✓	✓	
<i>Dryopteris dilatata</i>	✓	✓	✓	✓	Constant
<i>Epilobium montanum</i>				✓	
<i>Galium aparine</i>				✓	
<i>Geum urbanum</i>		✓	✓		
<i>Hyacinthoides non-scripta</i>	✓		✓		
<i>Hypericum hirsutum</i>		✓			
<i>Lathraea squamaria</i>		✓			
<i>Lonicera periclymenum</i>	✓			✓	
<i>Luzula sylvatica</i>	✓	✓	✓	✓	Constant
<i>Lysimachia nummularia</i>	✓		✓		
<i>Mercurialis perennis</i>	✓	✓	✓	✓	Constant
<i>Oxalis acetosella</i>			✓		

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4 x 4m ground flora 20 m x 40 m canopy	A1	A2	A3	A4	Domin Category
<i>Poa nemoralis</i>			✓		
<i>Poa trivialis</i>	✓				
<i>Polystichum aculeatum</i>	✓	✓	✓		Constant
<i>Primula vulgaris</i>		✓	✓	✓	Constant
<i>Ranunculus ficaria</i>	✓			✓	
<i>Rubus fruticosus</i>	✓	✓	✓	✓	Constant
<i>Sambuca nigra (seedling)</i>			✓	✓	
<i>Teucrium scorodonia</i>			✓		
<i>Urtica dioica</i>		✓		✓	
<i>Veronica chamaedrys</i>			✓		
<i>Veronica montana</i>	✓	✓	✓	✓	Constant
<b>Bryophytes</b>					
<i>Atrichum undulatum</i>	✓				
<i>Brachythecium rutabalum</i>	✓	✓	✓	✓	Constant
<i>Eurhynchium striatum</i>	✓		✓	✓	Constant
<i>Isoetium myosuroides</i>	✓				
<i>Kindbergia praelonga</i>		✓	✓	✓	Constant
<i>Lophocolea bidentata</i>	✓			✓	
<i>Mnium hornum</i>	✓				
<i>Plagiochila porelloides</i>	✓				
<i>Thamnobryum alopecurum</i>	✓	✓			
<i>Thuidium tamariscinum</i>	✓	✓			
<b>Ground flora species diversity (excluding saplings)</b>					<b>42</b>
<b>Other Species in the immediate area</b>					
<i>Carex sylvatica</i>					
<i>Hedera helix</i>					
<i>Viola riviniana</i>					
<i>Sorbus aucuparia</i>					
<i>Ulmus glabra</i>					

**Table 3: Stand B Quadrats**

4 x 4m ground flora 20 m x 40 m canopy	B1	B2	B3	Domin Category
<b>Grid ref</b>	NZ17517 99924	NZ17535 99904	NZ17538 99898	
<b>Aspect-</b> South Facing				
<b>Location-</b> North side of river Coquet, East of A1				
<b>Canopy (20 m)</b>				
<i>Acer pseudoplatanus</i>				9
<i>Fraxinus excelsior</i>				4
<i>Quercus petraea</i>				1
<b>Understory (5-10 m)</b>				
<i>Corylus avellana</i>				2
<i>Fraxinus excelsior (saplings)</i>				
<i>Acer pseudoplatanus (saplings)</i>				
<i>Ilex aquifolium</i>				1
<i>Crataegus monogyna</i>				2
<b>Ground flora (10 cm)</b>				

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4 x 4m ground flora 20 m x 40 m canopy	B1	B2	B3	Domin Category
<i>Ajuga reptans</i>		✓		
<i>Allium ursinum</i>	✓	✓		Constant
<i>Anemone nemorosa</i>	✓	✓	✓	Constant
<i>Chrysosplenium oppositifolium</i>	✓		✓	
<i>Crataegus monogyna</i> (seedling)		✓		
<i>Dryopteris borreii</i>	✓		✓	Constant
<i>Dryopteris dilatata</i>	✓	✓		Constant
<i>Filipendula ulmaria</i>	✓		✓	Constant
<i>Galium aparine</i>	✓		✓	Constant
<i>Geum urbanum</i>		✓		
<i>Hyacinthoides non-scripta</i>	✓	✓	✓	Constant
<i>Lysimachia nummularia</i>	✓	✓		Constant
<i>Mercurialis perennis</i>	✓		✓	Constant
<i>Poa trivialis</i>			✓	
<i>Potentilla sterilis</i>		✓		
<i>Primula vulgaris</i>		✓		
<i>Ranunculus ficaria</i>	✓	✓	✓	Constant
<i>Rubus fruticosus</i>	✓	✓		Constant
<i>Urtica dioica</i>	✓			
<i>Veronica montana</i>	✓	✓		Constant
<b>Bryophytes</b>				
<i>Brachythecium rutabalum</i>	✓	✓	✓	Constant
<i>Thamnobryum alopecurum</i>		✓	✓	Constant
<i>Thuidium tamariscinum</i>		✓	✓	Constant
<b>Ground flora species diversity (excluding saplings)</b>				<b>22</b>
<b>Other Species in the immediate area</b>				
<i>Glechoma hederacea</i>				
<i>Oxalis acetosella</i>				
<i>Ulmus glabra</i>				
<i>Luzula sylvatica</i>				

**Table 4: Stand C Quadrats**

4 x 4 m ground flora 20 m x 40 m canopy	C1	C2	C3	C4	Domin Category
<b>Grid ref</b>	NZ17392 99838	NZ17399 99842	NZ17398 99871	NZ17386 99877	
<b>Aspect</b> – South facing					
<b>Location</b> - North side of river Coquet, West of A1					
<b>Canopy (20 m)</b>					
<i>Acer pseudoplatanus</i>					8
<i>Fraxinus excelsior</i>					4
<i>Ulmus glabra</i>					2
<i>Quercus petraea</i>					3
<i>Sorbus acuparia</i>					2
<b>Understory (2-5 m)</b>					
<i>Corylus avellana</i>					7
<i>Acer pseudoplatanus</i> (saplings)					3
<i>Ilex aquifolium</i>					2
<i>Crataegus monogyna</i>					4

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4 x 4 m ground flora 20 m x 40 m canopy	C1	C2	C3	C4	Domin Category
<i>Sorbus acuparia</i>					1
<b>Ground flora (10-15 cm)</b>					
<i>Ajuga reptans</i>	✓			✓	
<i>Allium ursinum</i>	✓	✓	✓	✓	Constant
<i>Anemone nemorosa</i>	✓	✓	✓	✓	Constant
<i>Brachypodium sylvaticum</i>	✓		✓		
<i>Carex sylvatica</i>	✓		✓		
<i>Conopodium majus</i>			✓		
<i>Corylus avellana</i>	✓				
<i>Deschampsia cespitosa</i>	✓	✓		✓	Constant
<i>Dryopteris borrieri</i>	✓	✓	✓		Constant
<i>Dryopteris carthusiana</i>		✓	✓	✓	Constant
<i>Dryopteris dilatata</i>	✓	✓		✓	Constant
<i>Filipendula ulmaria</i>	✓	✓	✓		Constant
<i>Geum urbanum</i>	✓	✓		✓	Constant
<i>Hedera helix</i>		✓			
<i>Hyacinthoides non-scripta</i>	✓		✓	✓	Constant
<i>Lonicera periclymenum</i>				✓	
<i>Luzula pilosa</i>				✓	
<i>Melica uniflora</i>			✓		
<i>Mercurialis perennis</i>	✓	✓	✓		Constant
<i>Poa trivialis</i>	✓	✓	✓		Constant
<i>Polystichum aculeatum</i>		✓			
<i>Potentilla sterilis</i>			✓		
<i>Primula vulgaris</i>			✓	✓	
<i>Ranunculus ficaria</i>	✓	✓			
<i>Rubus fruticosus</i>			✓	✓	
<i>Veronica chamaedrys</i>	✓		✓		
<i>Veronica montana</i>	✓	✓			
<i>Viola riviniana</i>			✓		
<b>Bryophytes</b>					
<i>Atrichum undulatum</i>		✓	✓		
<i>Brachythecium rutabalum</i>	✓	✓	✓	✓	Constant
<i>Isoetium myosuroides</i>		✓		✓	
<i>Plagiomnium undulatum</i>	✓	✓			
<i>Thamnobryum alopecurum</i>	✓				
<i>Thuidium tamariscinum</i>	✓	✓	✓	✓	Constant
<i>Eurhynchium striatum</i>			✓		
<b>Ground flora species diversity (excluding saplings)</b>					<b>35</b>
<b>Other Species in the immediate area</b>					
<i>Angelica sylvestris</i>					
<i>Carex pendula</i>					
<i>Stachys sylvatica</i>					

**Table 5: Stand D Quadrats**

4 x 4 m ground flora 40 m x 40 m canopy	D1	D2	D3	D4	Domin Category
<b>Grid ref</b>	NZ17291 99732	NZ17287 99714	NZ17312 99732	NZ17311 99729	
<b>Aspect – North facing</b>					

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4 x 4 m ground flora 40 m x 40 m canopy	D1	D2	D3	D4	Domin Category
<b>Location-</b> South side of river Coquet, West of A1					
<b>Canopy (25-30 m)</b>					
<i>Acer pseudoplatanus</i>					8
<i>Fraxinus excelsior</i>					7
<i>Ulmus glabra</i>					2
<i>Quercus petraea</i>					1
<i>Sorbus acuparia</i>					3
<b>Understory (5 m)</b>					
<i>Corylus avellana</i>					2
<i>Ilex aquifolium</i>					1
<i>Crataegus monogyna</i>					3
<i>Sorbus acuparia</i>					3
<b>Ground flora (15 cm)</b>					
<i>Ajuga reptans</i>			✓	✓	
<i>Allium ursinum</i>	✓	✓	✓	✓	Constant
<i>Anemone nemorosa</i>	✓	✓	✓	✓	Constant
<i>Blechnum spicant</i>		✓	✓		
<i>Carex sylvatica</i>	✓	✓	✓	✓	Constant
<i>Deschampsia cespitosa</i>	✓	✓		✓	Constant
<i>Dryopteris borreii</i>	✓	✓	✓	✓	Constant
<i>Dryopteris carthusiana</i>		✓			
<i>Dryopteris dilatata</i>	✓	✓	✓	✓	Constant
<i>Filipendula ulmaria</i>		✓			
<i>Galium aparine</i>		✓	✓		
<i>Geum urbanum</i>		✓	✓	✓	Constant
<i>Hyacinthoides non-scripta</i>	✓		✓		
<i>Lysimachia nummularia</i>		✓			
<i>Mercurialis perennis</i>	✓	✓	✓	✓	Constant
<i>Oxalis acetosella</i>	✓	✓			
<i>Poa trivialis</i>		✓			
<i>Potentilla sterilis</i>		✓			
<i>Primula vulgaris</i>	✓	✓	✓	✓	Constant
<i>Ranunculus ficaria</i>	✓	✓	✓	✓	Constant
<i>Veronica chamaedrys</i>		✓	✓		
<i>Veronica montana</i>	✓	✓	✓	✓	Constant
<i>Viola riviniana</i>		✓			
<b>Bryophytes</b>					
<i>Brachythecium rutabalum</i>	✓	✓	✓	✓	Constant
<i>Fissidens taxifolius</i>				✓	
<i>Hookeria lucens</i>	✓				
<i>Hypnum jutlandicum</i>			✓		
<i>Kindbergia praelonga</i>		✓	✓		
<i>Lophocolea bidentata</i>		✓			
<i>Mnium hornum</i>			✓		
<i>Plagiochila porelloides</i>		✓			
<i>Plagiomnium undulatum</i>	✓	✓		✓	Constant
<i>Rhizomnium punctatum</i>		✓			
<i>Scapania nemorea</i>	✓				
<i>Thuidium tamariscinum</i>	✓	✓	✓	✓	Constant
<b>Ground flora species diversity (excluding saplings)</b>					<b>35</b>



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4 x 4 m ground flora 40 m x 40 m canopy	D1	D2	D3	D4	Domin Category
<b>Other Species in the immediate area</b>					
<i>Luzula pilosa</i>					
<i>Chrysosplenium oppositifolium</i>					
<i>Lonicera periclymenum</i>					

**Table 6: Stand E Quadrats**

4 x 4m ground flora 20 m x 20 m canopy	E1	E2	E3	Domin Category
<b>Grid ref</b>	NZ17635 99844	NZ17635 99839	NZ17625 99838	
<b>Aspect</b> – North Facing				
<b>Location</b> - South side of river Coquet, East of A1				
<b>Canopy (25 m)</b>				
<i>Acer pseudoplatanus</i>				8
<i>Fraxinus excelsior</i>				3
<i>Ulmus glabra</i>				2
<b>Understory (5-10 m)</b>				
<i>Corylus avellana</i>				1
<i>Acer pseudoplatanus</i> (saplings)				2
<i>Fraxinus excelsior</i> (saplings)				2
<i>Sorbus acuparia</i>				1
<b>Ground flora (20 cm)</b>				
<i>Allium ursinum</i>			✓	
<i>Anemone nemorosa</i>	✓	✓	✓	Constant
<i>Chrysosplenium oppositifolium</i>	✓	✓	✓	Constant
<i>Doronicum pardalianches</i>	✓		✓	Constant
<i>Dryopteris borrieri</i>	✓	✓	✓	Constant
<i>Dryopteris dilatata</i>	✓		✓	Constant
<i>Galium aparine</i>	✓	✓		Constant
<i>Hyacinthoides non-scripta</i>	✓			
<i>Luzula sylvatica</i>	✓		✓	Constant
<i>Lysimachia nummularia</i>	✓			
<i>Mercurialis perennis</i>	✓	✓	✓	Constant
<i>Oxalis acetosella</i>	✓		✓	Constant
<i>Poa trivialis</i>	✓	✓	✓	Constant
<i>Ranunculus ficaria</i>	✓	✓	✓	Constant
<i>Silene dioica</i>	✓			
<i>Urtica dioica</i>		✓		
<i>Veronica montana</i>		✓		
<b>Bryophytes</b>				
<i>Atrichum undulatum</i>				
<i>Brachythecium rutabalum</i>	✓	✓	✓	Constant
<i>Fissidens taxifolius</i>	✓			
<i>Plagiomnium undulatum</i>			✓	
<i>Thuidium tamariscinum</i>	✓		✓	Constant
<b>Ground flora species diversity (excluding saplings)</b>				<b>22</b>
<b>Other Species in the immediate area</b>				

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*Prunus padus*

**Table 7: Stand F Quadrats**

4 x 4 m ground flora 20 m x 40 m canopy	F1	F2	F3	F4	Domin Category
<b>Grid ref</b>	NZ17581 99831	NZ17565 99813	NZ17584 99834	NZ17588 99833	
<b>Aspect</b> – North Facing					
<b>Location</b> - South side of river Coquet, East of A1 (between D &E)					
<b>Canopy (25 m)</b>					
<i>Acer pseudoplatanus</i>					8
<i>Sorbus acuparia</i>					5
<i>Ulmus glabra</i>					7
<i>Quercus robur</i>					1
<i>Quercus petraea</i>					1
<b>Understory (5 m)</b>					
<i>Corylus avellana</i>					1
<i>Ilex aquifolium</i>					1
<i>Ulmus glabra</i>					3
<b>Ground flora (20 cm)</b>					
<i>Ajuga reptans</i>			✓		
<i>Allium ursinum</i>				✓	
<i>Anemone nemorosa</i>	✓	✓	✓	✓	Constant
<i>Conopodium majus</i>				✓	
<i>Dryopteris dilatata</i>	✓	✓	✓	✓	Constant
<i>Galium aparine</i>	✓	✓	✓		Constant
<i>Hyacinthoides non-scripta</i>	✓	✓	✓	✓	Constant
<i>Luzula sylvatica</i>	✓	✓	✓	✓	Constant
<i>Mercurialis perennis</i>	✓	✓	✓	✓	Constant
<i>Oxalis acetosella</i>			✓		
<i>Ranunculus ficaria</i>	✓		✓	✓	Constant
<i>Rubus fruticosus</i>		✓	✓		
<i>Veronica montana</i>				✓	
<b>Bryophytes</b>					
<i>Brachythecium rutabalum</i>	✓	✓	✓	✓	Constant
<i>Isoetecium myosuroides</i>		✓	✓	✓	Constant
<i>Kindbergia praelonga</i>	✓	✓			
<i>Plagiochila porelloides</i>	✓	✓		✓	Constant
<i>Plagiomnium undulatum</i>	✓				
<i>Thuidium tamariscinum</i>	✓	✓	✓	✓	Constant
<b>Ground flora species diversity (excluding saplings)</b>					<b>19</b>
<b>Other Species in the immediate area</b>					
<i>Adoxa moschatellina</i>					
<i>Crataegus monogyna</i>					
<i>Lysimachia nummularia</i>					
<i>Taxus baccata</i>					

**Table 8. Ancient Woodland Indicators Species Recorded**

Species	Location on site
<i>Adoxa moschatellina</i>	Mostly along paths and river edge
<i>Allium ursinum</i>	Throughout but more so in stands B, C and F
<i>Anemone nemorosa</i>	Throughout
<i>Brachypodium sylvaticum</i>	Throughout
<i>Carex sylvatica</i>	Throughout but not abundant
<i>Galium odoratum</i>	Mostly along paths
<i>Hyacinthoides non-scripta</i>	Throughout
<i>Lathraea squamaria</i>	Localised
<i>Lonicera periclymenum</i>	Localised
<i>Luzula pilosa</i>	Localised
<i>Melica uniflora</i>	Localised
<i>Mercurialis perennis</i>	Throughout
<i>Oxalis acetosella</i>	Localised
<i>Poa nemoralis</i>	Throughout
<i>Polystichum aculeatum</i>	Localised
<i>Potentilla sterilis</i>	Localised
<i>Ranunculus auricomus</i>	Mostly along paths
<i>Sanicula europaea</i>	Along paths and riverside
<i>Veronica montana</i>	Throughout

## 4 CONCLUSIONS

- 4.1.1 Despite the variation in ground flora observed, all six stands when assessed individually through the NVC woodland descriptive keys were found to be a good fit to W9 *Fraxinus excelsior* - *Sorbus aucuparia* - *Mercurialis perennis* woodland, typical sub-community. This typical sub-community is commonly found by streams and flush lines in the uplands, where the climate is cool, wet and windy, and hence unsuitable for the more continental species such as spindle (*Euonymus europaea*) and wayfaring tree (*Viburnum lantana*) found in south-eastern mixed deciduous woods (W8 *Fraxinus excelsior* – *Acer campestre* – *Mercurialis perennis* woodland; W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus* woodland). Of the 10 constant species listed for the W9 woodland community nine were recorded across the survey stands. Overall, some stands surveyed were more diverse than typically found and the localised abundance of *Allium ursinum* in some stands is atypical (commonly forming large woodland stands and common close to water) but nonetheless, the woodland as a whole fits well with W9. A total of 59 ground flora species were recorded within all quadrats (excluding saplings but including 16 bryophyte species).
- 4.1.2 Duke's Bank Wood which comprises the southern bank of the River Coquet and Coquet Woodlands SSSI is classed as ancient and semi-natural woodland although the woody species within the survey area could not in themselves be assessed as ancient, due to regrowth following past felling resulting in a generally even-aged stand. In total, 19 ancient woodland indicator species were recorded over the six stands in the survey area (Table 8). Greater numbers of indicator species were noted to the north of the river within Mill Banks (a mean of nine species per stand compared to seven south of the River Coquet). However, high numbers of woodland indicators provide a good sign that a woodland may be ancient, but are not proof on their own, rather an indication of likelihood. Additionally, indicator species are not found exclusively within ancient woodlands.

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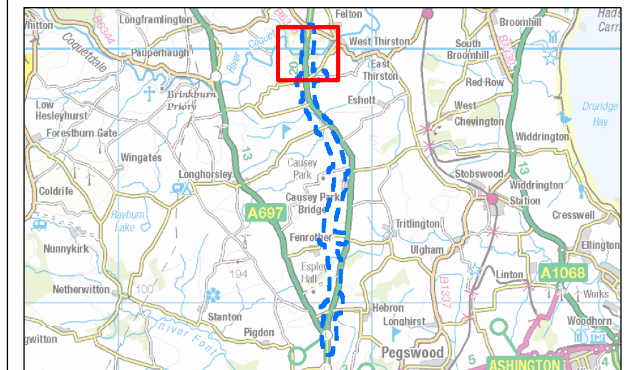
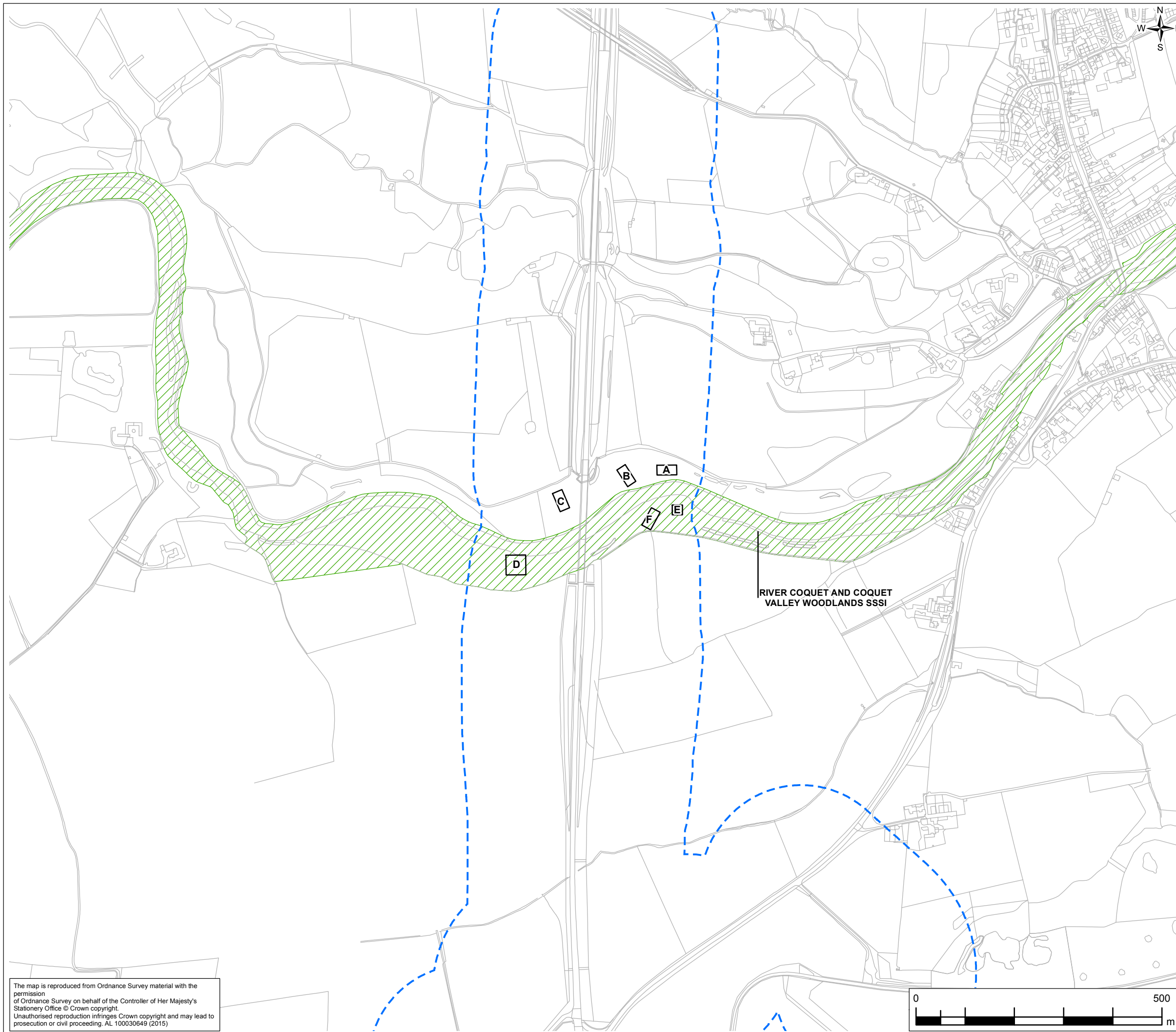
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Figure 1: River Coquet and Coquet Valley Woodlands SSSI Location Plan  
Figure 2: Quadrat Survey Locations

**FIGURE 1**

**Legend**

-  200m Buffer from Offline Option
-  Site of Special Scientific Interest (SSSI)
-  NVC Survey Stand



0	JAN 18	Initial Issue	LT	IM	AM	MC
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd



Client 

Project **A1 IN NORTHUMBERLAND**

Drawing Title **SECTION A  
RIVER COQUET AND COQUET VALLEY  
WOODLANDS SSSI LOCATION PLAN**

Drawing Status

Scale @ A3: 1:7,500 **DO NOT SCALE**

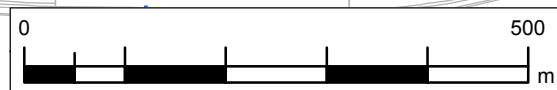
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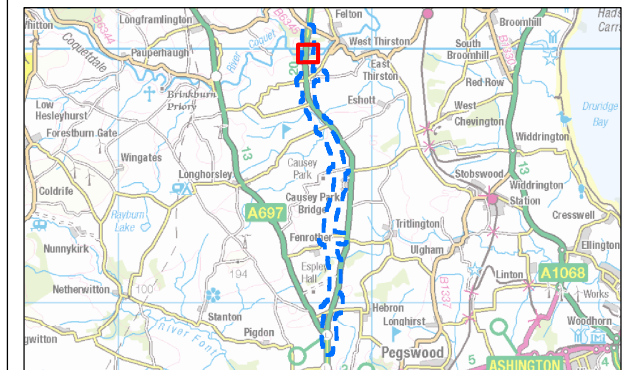
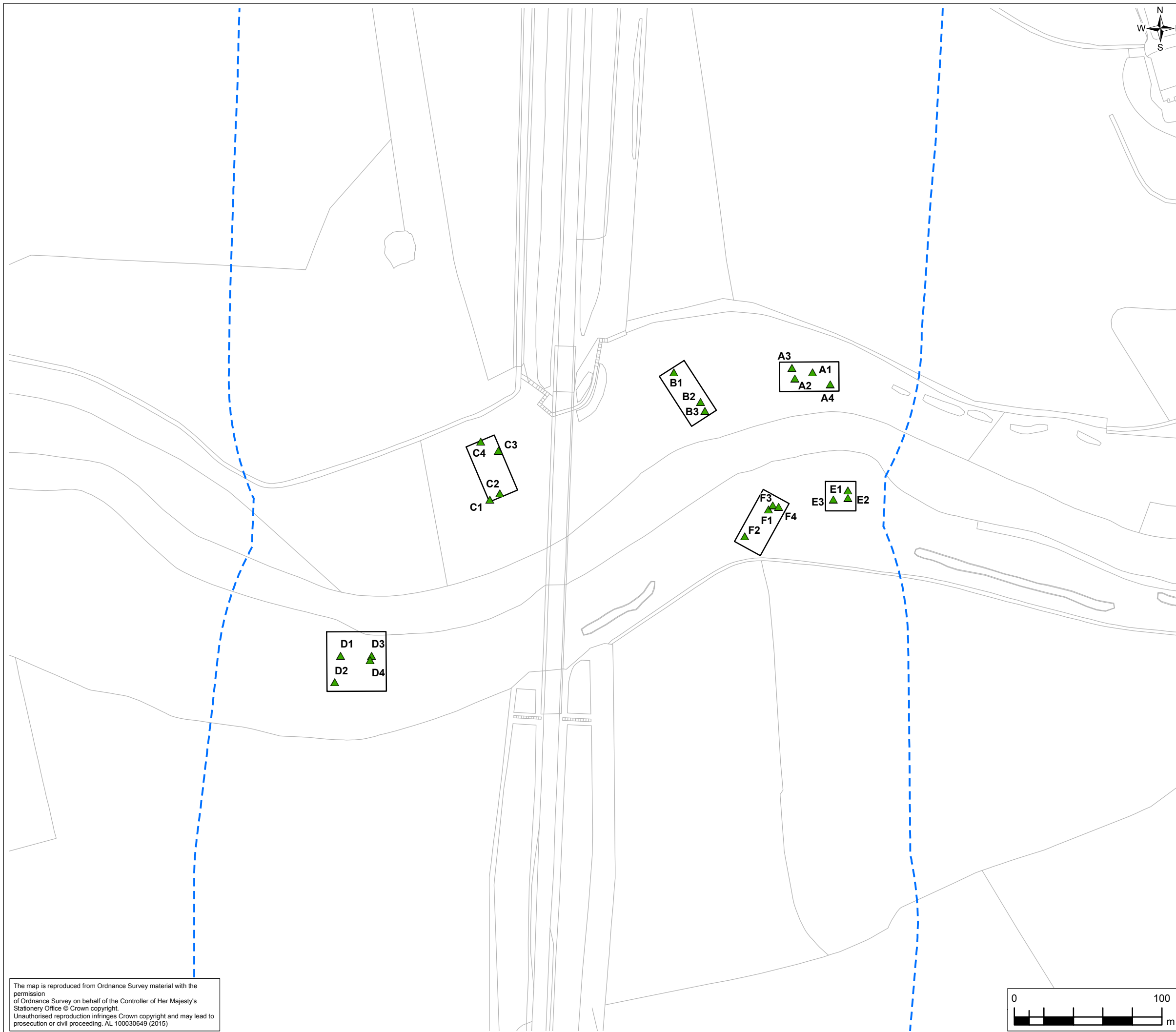
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**FIGURE 2**

**Legend**

-  200m Buffer from Offline Option
-  NVC Quadrat (Ground flora)
-  NVC Survey Stand



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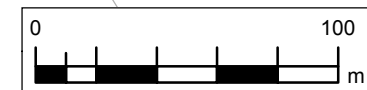
Project **A1 IN NORTHUMBERLAND**

Drawing Title **SECTION A  
 NATIONAL VEGETATION CLASSIFICATION MAP**

Drawing Status		
Scale @ A3	1:2,500	DO NOT SCALE
Jacobs No.	B2104700	
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## APPENDIX A: SPECIES LIST

Common Name	Scientific Name
<b>Ground Flora</b>	
Barren strawberry	<i>Potentilla sterilis</i>
Bluebell	<i>Hyacinthoides non-scripta</i>
Bramble	<i>Rubus fruticosus</i>
Broad Buckler fern	<i>Dryopteris dilatata</i>
Broad-leaved willowherb	<i>Epilobium montanum</i>
Bugle	<i>Ajuga reptans</i>
Cleavers	<i>Galium aparine</i>
Common dog violet	<i>Viola riviniana</i>
Common nettle	<i>Urtica dioica</i>
Dog's mercury	<i>Mercurialis perennis</i>
Elder (seedling)	<i>Sambuca nigra</i>
False brome	<i>Brachypodium sylvaticum</i>
Germander speedwell	<i>Veronica chamaedrys</i>
Golden creeping jenny	<i>Lysimachia nummularia</i>
Great wood-rush	<i>Luzula sylvatica</i>
Hairy St-John's-wort	<i>Hypericum hirsutum</i>
Hairy wood-rush	<i>Luzula pilosa</i>
Hard fern	<i>Blechnum spicant</i>
Hard shield fern	<i>Polystichum aculeatum</i>
Hawthorn (seedling)	<i>Crataegus monogyna</i>
Hazel (seedling)	<i>Corylus avellana</i>
Honeysuckle	<i>Lonicera periclymenum</i>
Ivy	<i>Hedera helix</i>
Lady fern	<i>Athyrium filix-femina</i>
Leopard's-bane	<i>Doronicum pardalianches</i>
Lesser celandine	<i>Ranunculus ficaria</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Narrow Buckler fern	<i>Dryopteris carthusiana</i>
Opposite-leaved golden saxifrage	<i>Chrysosplenium oppositifolium</i>
Pendulous sedge	<i>Carex pendula</i>
Pignut	<i>Conopodium majus</i>
Primrose	<i>Primula vulgaris</i>
Ramsons	<i>Allium ursinum</i>
Red campion	<i>Silene dioica</i>
Rough meadow-grass	<i>Poa trivialis</i>
Scaly male fern	<i>Dryopteris borneri</i>
Toothwort	<i>Lathraea squamaria</i>
Tufted hair-grass	<i>Deschampsia cespitosa</i>
Wood anemone	<i>Anemone nemorosa</i>
Wood avens	<i>Geum urbanum</i>
Wood meadow-grass	<i>Poa nemoralis</i>
Wood melick	<i>Melica uniflora</i>

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Common Name	Scientific Name
Wood sage	<i>Teucrium scorodonia</i>
Wood sorrel	<i>Oxalis acetosella</i>
Wood speedwell	<i>Veronica montana</i>
Wood-sedge	<i>Carex sylvatica</i>
<b>Canopy</b>	
Ash	<i>Fraxinus excelsior</i>
Pedunculate oak	<i>Quercus robur</i>
Rowan	<i>Sorbus aucuparia</i>
Sessile oak	<i>Quercus petraea</i>
Silver birch	<i>Betula pendula</i>
Sycamore	<i>Acer pseudoplatanus</i>
Wych elm	<i>Ulmus glabra</i>
<b>Understorey</b>	
Ash (sapling)	<i>Fraxinus excelsior</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus avellana</i>
Holly	<i>Ilex aquifolium</i>
Rowan	<i>Sorbus aucuparia</i>
Sycamore (sapling)	<i>Acer pseudoplatanus</i>
Wych elm	<i>Ulmus glabra</i>
<b>Bryophytes</b>	
Bifid crestwort	<i>Lophocolea bidentata</i>
Common feather-moss	<i>Kindbergia praelonga</i>
Common pocket-moss	<i>Fissidens taxifolius</i>
Common smoothcap	<i>Atrichum undulatum</i>
Common striated feather-moss	<i>Eurhynchium striatum</i>
Common Tamarisk-moss	<i>Thuidium tamariscinum</i>
Dotted thyme-moss	<i>Rhizomnium punctatum</i>
Fox-tail feather-moss	<i>Thamnobryum alopecurum</i>
Grove earwort	<i>Scapania nemorea</i>
Hart's-tongue thyme-moss	<i>Plagiomnium undulatum</i>
heather plait-moss	<i>Hypnum jutlandicum</i>
Lesser featherwort	<i>Plagiochila porelloides</i>
<b>Other Species in the Immediate Area</b>	
Bird cherry	<i>Prunus padus</i>
Ground ivy	<i>Glechoma hederacea</i>
Hedge woundwort	<i>Stachys sylvatica</i>
Moschatel	<i>Adoxa moschatellina</i>
Wild angelica	<i>Angelica sylvestris</i>
Yew	<i>Taxus baccata</i>

## **APPENDIX B: CITATION FOR RIVER COQUET AND COQUET VALLEY WOODLANDS SSSI**

A1 in Northumberland  
National Vegetation Classification (NVC) Survey Report

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SITE NOTIFIED TO THE SECRETARY OF STATE ON THE 31ST JULY 1996

COUNTY: NORTHUMBERLAND      SITE NAME: RIVER COQUET AND  
COQUET VALLEY WOODLANDS

**Status:** Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended.

**Local Planning Authorities:** Northumberland County Council  
Northumberland National Park  
Alnwick District Council  
Castle Morpeth Borough Council

**National Grid Reference:** NT 786082 to NU 260051      **Area:** 1192.42 (ha.)

**Ordnance Survey Sheets 1:50,000:** 80 and 81      **1:25,000:** NT 80, 81, 90,91  
NU 00, 10, 20  
NY 99, NZ 09,19

**Length of River:** 125 km approx

**First Notified:** 1996

**Description:**

The River Coquet runs about 90km (57 miles) across Northumberland, from its tributaries south of Cheviot summit to reach the sea below Warkworth. As a relatively unmodified fast-flowing upland river supporting characteristic fauna and flora the Coquet is of key significance in the national resource for nature conservation. The river vegetation shows a natural succession from mineral poor upland streams, through to vegetation which reflects the characteristics of gravel, sandstone, limestone and alluvial sediments of the middle and lower reaches. The river is one of the most important game fisheries in the north of England, with large runs of sea trout and salmon. The fish are dependent on the rich insect life, of which the many species of mayfly are particularly significant. Coquetdale is a key area for otters and supports a high diversity of breeding birds which depend on riverine habitats. Many of the woodlands near the river are semi-natural and ancient woodland sites, representative of valley woodlands in Northumberland.

High in the Cheviot Hills the upper reaches of the river are torrential moorland streams on resistant bedrock. The descent becomes more gradual and substrates less stable in the middle reaches as the underlying geology changes in turn to cement stone, sandstone and limestone. Where the flood plain broad river meanders across the riverine deposits, forming oxbows, pools and marshy areas as the river channel moves with time. The lower river cuts through thick drift deposits, in places reaching underlying limestones and millstone grit, and forming a steep-sided, often wooded, valley with boulders along the river bed. Run-off within the catchment is very rapid, causing short but often violent floods. The water is clean, low in mineral content and moderately calcareous.

The plant life of the upper reaches, beyond Alwinton, 125m above sea level, is dominated by species typical of base and nutrient poor upland rivers. Several mosses including *Bryum pseudotriquetrum*, *Fontinalis antipyretica*, *Racomitrium aciculare* and *Philonotis fontana* are abundant on boulders and bed rocks. The lack of tree cover in the grazed moorland catchment influences the vegetation of the river with filamentous green algae a characteristic feature. Two species of water-crowfoot; *Ranunculus penicillatus* v. *pseudofluitans* and *R. peltatus* are the most commonly found water plants of slacks and riffles. A diatom, *Didymosphenia*, found in the upper reaches, is a species which

produces a seasonal bloom in streams on volcanic rocks; and the Cheviots are the only location in England where this phenomenon is recorded. Waterside plants including soft-rush *Juncus effusus*, common spike-rush *Eleocharis palustris*, procumbent pearlwort *Sagina procumbens*, blinks *Monta fontana* and a variety of sedges *Carex* spp. occur along the banks. Between Alwinton and Rothbury the river flows through a transitional zone taking a meandering course over a relatively level floodplain. Water-crowfoots *Ranunculus* spp. are the dominant plants, floating over the gravel and pebbles of the river bed. Below Rothbury in the lower reaches where the river cuts through sand, gravel and alluvium the richer and finer sediments support a greater diversity of plants. On rocks, the mosses *Fontinalis antipyretica* and *Rhyncostegium lusitanicum* are found. River water-crowfoot *Ranunculus fluitans*, characteristic of large clean rivers, is common on riffles while the presence of curled, perfoliate and horned pondweeds *Potamogeton crispus*, *P. perfoliatus* and *Zannichellia palustris*, branched and unbranched bur-weeds *Sparganium erectum* and *S. emersum* and the alga *Enteromorpha* reflect the base-rich nature of the river.

Many of the species of insects dependent on the river are typical of fast flowing waters. Most noticeable are the large numbers of caddis flies, *Trichoptera* and black flies, *Simulilidae*, with larvae living on the river bed, and the mayflies and stoneflies which emerge from their larval stars in the water for short lives on the wing. Of 23 species of mayfly identified from the river, two; *Ephemerella notata* and *Ameletus inopinatus* have a restricted distribution. The riverside shingle and sand habitats support an important assemblage of ground beetles with several nationally scarce species including *Bembidion schuppeli*.

The birdlife associated with the Coquet includes large numbers of common sandpipers, grey and yellow wagtails which nest and feed in high densities along or near the river above Alwinton. Oystercatchers, ringed plover, lapwing, snipe and redshank all breed on the haugh land, or floodplain. Dippers are common along the entire length and, unusually for a northern river, kingfishers hold several nesting territories in the lower reaches.

The lower and middle reaches of the river provide undisturbed habitat for otters, which are known to range throughout the catchment. The rich insect life also creates feeding grounds for bat colonies which roost and rear their young within the valley. Of particular note is the area around Brinkburn Priory where colonies of Daubenton's, natterer's, noctule, whiskered, Brandt's and pipistrelle bats have nursery roosts. The river is frequented by water voles along much of its length.

The fish fauna of the Coquet is diverse with salmon and trout being particularly significant. Salmon *Salmo salar* are known to spawn in the main river, with redds at Rothbury and upstream to Blindburn and along the River Alwin and the Wreighburn. Over 20,000 sea trout *Salmo trutta trutta* travel up the main river to spawn in many of the tributaries (1994); the River Alwin, the Rowhope and Trows Burns and several of the Wreigh Burn tributaries provide extensive spawning grounds. Also important is the occurrence of lampreys; brook lampreys *Lampetra planeri* have been recorded in the fresh waters as high as Alwinton, with sea lampreys *Petromyzon marinus* coming into the lower river, below Morwick, to breed. Other fish found regularly in the river system include stone loach *Noemacheilus barbatulus*, eels *Anguilla anguilla*, minnows *Phoxinus phoxinus* and sticklebacks *Gasterosteus aculeatus*.

The Coquet valley has several woodlands which are as being long established, relatively unmodified by planting and retaining semi-natural plant communities. There are few such woodlands now remaining in Northumberland and most are confined to steep river valleys, as along the Coquet below Rothbury. Most of the woodlands included in this site are of those along river valleys in the east of the County. Red squirrels are found in many of the woodlands.

Much of the woodland immediately adjacent to the river is characterised by alder *Alnus glutinosa*, occasionally associated with ash *Fraxinus excelsior* or willows *Salix* spp. The ground flora here is diverse and characterised by meadowsweet *Filipendula ulmaria* and tufted hair-grass *Deschampsia cespitosa*, with pendulous sedge *Carex pendula*, yellow pimpernel *Lysimachia nemorum*, woodruff *Galium odoratum* and locally marsh Hawk's-beard *Crepis paludosa* and opposite-leaved golden-saxifrage *Chrysosplenium oppositifolium*. In the lower reaches where silt and debris is deposited the alder woodland has a species-poor ground flora characterised by stinging nettle *Urtica dioica* and cleavers *Galium aparine* and is locally bordered by osier *Salix viminalis*, both uncommon woodland habitats in Northumberland. Further back from the river ash and pedunculate oak *Quercus robur* are typical canopy species with wych elm *Ulmus glabra* found in some areas. Climbers including ivy *Hedera helix*, brambles *Rubus fruticosus* and honeysuckle *Lonicera periclymenum* are found in the oak woodlands with species-rich ground floras often dominated by great wood-rush *Luzula sylvatica* and other species present include bluebell *Hyacinthoides non-scripta*, wood-sorrel *Oxalis acetosella*, hedge woundwort *Stachys sylvatica* and wood avens *Geum urbanum*. Hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, rowan *Sorbus aucuparia*, holly *Ilex aquifolia* and downy birch *Betula pubescens* are the main shrub species found in the ash woods with dog's mercury *Mercurialis perennis* often dominating the ground flora and associated with wood avens *Geum urbanum*, enchanter's nightshade *Circea lutetiana*, several ferns including male-fern *Dryopteris filix-mas*, broad buckler-fern *Dryopteris dilatata* and lady-fern *Athyrium filix-femina*, an abundance of mosses and occasionally sanicle *Sanicula europea*.

**Other Information:**

Parts of this site are notified as separate SSSIs under the Wildlife and Countryside Act 1981, as amended; overlapping SSSI are: Linbriggs, Harbottle Moors and Barrow Meadows. The River Coquet SSSI also abuts Warkworth Dunes and Saltmarsh SSSI.

Otters, red squirrel and all species of bats in Britain are protected under Schedule 5 of the Wildlife and Countryside Act 1981, otters and bats are also listed on schedule 2 of The Conservation (Natural Habitats, etc) Regulations 1994.

Floating vegetation of *Ranunculus* of plain and submountainous rivers is a habitat listed in Annex I of the EC Habitats and Species Directive (92/43/EEC). Of species associated with the River Coquet, Annexes IIa, VIa and Va of the EC Habitats and Species Directive (92/43/EEC) list the following as specially protected: otters (IIa, IVa), all species of bats (IVa), salmon (IIa, Va) and all species of lamprey (IIa).

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