

**A66 Northern Trans-Pennine Project  
TR010062**

**3.4 Environmental Statement  
Appendix 6.5 Phase 2 National  
Vegetation Classification**

**APFP Regulations 5(2)(a)**

**Planning Act 2008**

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

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Infrastructure Planning

Planning Act 2008

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

A66 Northern Trans-Pennine Project  
Development Consent Order 202x

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**3.4 ENVIRONMENTAL STATEMENT  
APPENDIX 6.5 PHASE 2 NATIONAL VEGETATION  
CLASSIFICATION**

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## 6.5 National Vegetation Classification Report

### 6.5.1 Introduction

#### Project background

- 6.5.1.1 The A66 Northern Trans-Pennine project is a programme of works to improve the A66 between the M6 at Penrith and A1 at Scotch Corner.
- 6.5.1.2 Between the M6 and the A1(M) the existing A66 is approximately 80km in length. Along this length it is intermittently dualled, with approximately 30km of single carriageway, in six separate sections, making the route accident prone and unreliable.
- 6.5.1.3 The route carries high levels of freight traffic and is an important route for tourism and connectivity to local communities. The variable road standards, together with the lack of available diversionary routes when incidents occur, affects road safety, reliability, resilience and attractiveness of the route
- 6.5.1.4 The route carries high levels of freight traffic and is an important route for tourism and connectivity to local communities. The variable road standards, together with the lack of available diversionary routes when incidents occur, affects road safety, reliability, resilience and attractiveness of the route. For a full project description see Chapter 2: The Project (Application Document 3.2).

#### Scope of the document

- 6.5.1.5 This report presents desk study data and baseline survey results relating to notable habitats and species of botanical interest.
- 6.5.1.6 Baseline surveys were conducted in 2021. It is intended that the information in this report will be used in conjunction with data from other surveys to identify and assess potential implications of the Project in relation to notable habitats and species of botanical interest and inform any mitigation and compensation required. This baseline report can be used to accompany any future planning application and associated Environmental Impact Assessment (EIA) for the Project.

### 6.5.2 Legislation and Policy Framework

#### Legislation

##### *Conservation of Habitats and Species Regulations 2017*

- 6.5.2.1 The Conservation of Habitats and Species Regulations 2017 offer protection to a number of plant and animal species via the designation of Special Areas of Conservation (SAC) and Special Protection Areas (SPA). In the United Kingdom these Regulations are implemented through the WCA 1981 (as amended).
- 6.5.2.2 The Regulations also offer protection to a number of 'European Protected Species' (EPS), and make it an offence to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4.

6.5.2.3 The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 does not make any substantive changes to the protection of SACs, SPAs or species classed as EPS.

#### *Wildlife and Countryside Act 1981*

6.5.2.4 The Wildlife and Countryside Act 1981 (as amended) is the primary legislation covering endangered species in England and sets out the framework for the designation of Sites of Special Scientific Interest (SSSI). It confers differing levels of protection on species themselves, their habitats, or both, depending on their conservation status.

6.5.2.5 Species offered protection by the Act are listed in a series of schedules. These schedules are subject to a rolling review on a five yearly basis. Schedule 8 of the WCA lists plants which are afforded protection under section 13 of the Act. Subject to certain provisions it is an offence to:

- intentionally or recklessly pick, uproot or destroy any wild plant included in Schedule 8 or any seed or spore attached to any such wild plant
- not being an authorised person, intentionally or recklessly uproots any wild plant not included in that Schedule

#### *Natural Environment and Rural Communities Act 2006*

6.5.2.6 The UK Biodiversity Action Plan (UKBAP) covering 2011-2020 has been superseded by the *UK Post-2010 Biodiversity Framework* (Joint Nature Conservation Committee, 2012)<sup>1</sup>. The framework identifies 65 Priority Habitats and 1150 Priority Species that are in need of protection. This list has been used to define habitats and species of 'Principal Importance' in England (the Section 41 list) as required by the Natural Environment and Rural Communities (NERC) Act 2006.

6.5.2.7 Section 41 includes 402 vascular and non-vascular plants and 56 habitats of Principle Importance (HoPI) (Natural England, 2022)<sup>2</sup>.

6.5.2.8 All planning decisions must be made with regard for the conservation of S41 species and habitats and any priority actions (Natural England, 2014)<sup>3</sup> associated with them.

#### *National Policy*

##### *National planning statement for national networks*

6.5.2.9 The primary policy basis for deciding whether or not to grant a Development Consent Order (DCO) is the *National Policy Statement for National Networks (NPSNN)* (Department for Transport, 2014)<sup>4</sup>, which sets out policies to guide how DCO applications will be decided and how the effects of national networks infrastructure should be considered by the relevant decision maker. The policies for biodiversity and ecological conservation include statements that:

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<sup>1</sup> Joint Nature Conservation Committee (2012) UK Post-2010 Biodiversity Framework

<sup>2</sup> Natural England (2022) Habitats and species of principal importance in England

<sup>3</sup> Natural England (2014) Priority Actions for S41 Species

<sup>4</sup> Department for Transport (2014) National Policy Statement for National Networks

*“Biodiversity is the variety of life in all its forms and encompasses all species of plants and animals and the complex ecosystems of which they are a part. Government policy for the natural environment is set out in the Natural Environment White Paper (NEWP). The NEWP sets out a vision of moving progressively from net biodiversity loss to net gain, by supporting healthy, well-functioning ecosystems and establishing more coherent ecological networks that are more resilient to current and future pressures...” (NPSNN paragraph 5.20)*

6.5.2.10 The NPSNN also advises:

*“In taking decisions, the Secretary of State should ensure that appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment.” (NPSNN paragraph 5.26)*

6.5.2.11 Table 1: NPSNN paragraphs of relevance to habitats and species of botanical interest identifies the NPSNN policies relevant to habitats and species of botanical interest.

Table 1: NPSNN paragraphs of relevance to habitats and species of botanical interest

Relevant NPSNN paragraph reference	Requirement of the NPSNN (paraphrase)
5.22	Outline any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems.
5.23	Demonstrate how the project has taken advantage of opportunities to conserve and enhance biodiversity conservation interests.
5.29	Ensure proposals mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site’s biodiversity are acceptable.
5.33	Development proposals potentially provide many opportunities for building in beneficial biodiversity features. Opportunities to maximise beneficial biodiversity features should be considered. Planning obligations can be used where appropriate in order to ensure that such beneficial features are delivered.
5.34 and 5.35	Individual wildlife species receive statutory protection under a range of legislative provisions. Other species and habitats have been identified as being of principal importance for the conservation of biodiversity in England and Wales. Undertake measures to ensure these species and habitats are protected from adverse effects. Where appropriate, requirements or planning obligations may be used in order to deliver this protection.
5.36	Include appropriate mitigation measures as an integral part of their proposed development, including identifying where and how these will be secured
5.37	Consider what appropriate requirements should be attached to any consent and/or in any planning obligations entered into in order to ensure that mitigation measures are delivered.

Relevant <i>NPSNN</i> paragraph reference	Requirement of the <i>NPSNN</i> (paraphrase)
5.38	Take account of what mitigation measures may have been agreed between the applicant and Natural England and/or the MMO, and whether Natural England and/or or the MMO has granted or refused, or intends to grant or refuse, any relevant licences, including protected species mitigation licences.

*National planning policy framework*

6.5.2.12 The *National planning policy framework (NPPF)* (Ministry of Housing, Communities & Local Government, 2021)<sup>5</sup> originally published in March 2012 and most recently updated in July 2021, sets out the government’s planning policies for England and provides a framework within which locally prepared plans can be produced. The NPPF is “an important and relevant matter to be considered in decision making for NSIP”.

*Regional and local level policy*

6.5.2.13 The designation and protection afforded to Local Nature Reserves (LNR), Local Wildlife Sites (LWS), Sites of Importance for Nature Conservation (SINCs), County Wildlife Sites (CWS), and locally important habitats and species are controlled by local council policies. Although the UK Biodiversity Action Plan (BAP) has been superseded, BAPs are still widely used at county level to support Biodiversity 2020 (Department for Environment Food and Rural Affairs, 2011)<sup>6</sup>

6.5.2.14 The following local planning policies and documents are relevant to this report:

- *Eden Local Plan 2014 to 2032* (Eden District Council, 2014)<sup>7</sup> Policy ENV1 and Policy ENV4
- *County Durham Plan - Adopted 2020* (Durham County Council, 2020)<sup>8</sup> Policy 26, Policy 40, Policy 41, Policy 42 and Policy 43
- *Richmondshire Local Plan 2012-2028* adopted 2014 (Richmondshire District Council, 2014)<sup>9</sup> Core Policy CP12
- *Cumbria BAP* (Cumbria Biodiversity Partnership, 2001)<sup>10</sup>
- *Durham County Council BAP* (2012/13) now listed on North East England Nature Partnership (North East England Nature Partnership, 2013)<sup>11</sup>

<sup>5</sup> Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework,

<sup>6</sup> Department for Environmental Food and Rural Affairs (2011) Biodiversity 2020: A Strategy for England’s Wildlife and Ecosystem Services. Department for Environment, Food and Rural Affairs, London.

<sup>7</sup> Eden District Council (2014) *Eden Local Plan 2014 to 2032*

<sup>8</sup> Durham Council (2020) *County Durham Plan – Adopted 2020*

<sup>9</sup> Richmond County Council (2014) *Richmondshire Local Plan 2012 - 2028 Core Strategy* (Adopted 9 December 2014),

<sup>10</sup> Cumbria Biodiversity Partnership (2001) *The Cumbria Biodiversity Action Plan*

<sup>11</sup> North East England Nature Partnership (2013) *Biodiversity Priorities*

- *Richmondshire District Councils BAP* (Richmond County Council, 2014)<sup>12</sup>

6.5.2.15 Habitats and species identified as priorities within relevant local BAPs are listed in Table 2: Habitats and plant species listed within local BAPs. Where possible duplicate habitat definitions have been combined. Where a habitat definition in one BAP is included within another BAP without being explicit identifies (XX) indicates the overlap.

Table 2: Habitats and plant species listed within local BAPs. Where possible duplicate habitat definitions have been combined. Where a habitat definition in one BAP is included within another BAP without being explicit identifies (XX) indicates the overlap

	Cumbria BAP	Durham BAP	Richmondshire BAP
Species			
Juniper ( <i>Juniperus communis</i> )	X		
Black poplar ( <i>Populus nigra</i> )		X	
Pale Bristle Moss ( <i>Orthotrichum pallens</i> )		X	
Yellow Marsh Saxifrage ( <i>Saxifraga hirculus</i> )		X	
Habitat			
Standing water		X	
Mesotrophic standing waters	X	(XX)	X
Rivers and streams	X	X	X
Cities towns and villages	X		X
Honeycomb worm reefs	X		
Farmland			X
Ancient and/ or species rich hedgerows	X	(XX)	X
Native hedgerows	(XX)	X	(XX)
Floodplain grassland			X
Calcareous grassland	X	(XX)	X
Magnesian Limestone Grassland		X	
Hay meadows and lowland pastures	X	X	X
Moorland edge including Upland acid grassland			X
Limestone pavement	X		
Purple moorgrass and rush pasture	X		
Blanket bog	X		
Upland heathland	X		X
Lowland heath		X	
Basin mire	X		
Lowland raised mire	X		
Reedbed	X	X	X

<sup>12</sup> Richmond County Council (2014) Richmondshire Biodiversity Action Plan,



	Cumbria BAP	Durham BAP	Richmondshire BAP
Fen		X	X
Woodland			X
Lowland wood pasture and parkland		X	X
Veteran trees		X	
Upland oak woodland	X	(XX)	(XX)
Upland mixed ashwood	X	(XX)	(XX)
Wet woodland	X	X	(XX)
Ancient Semi-Natural woodland		X	(XX)
Other broadleaved woodland		X	(XX)
Scrub		X	
Early successional brownfield sites		X	
Transport corridors		X	
Waxcap grassland		X	
Coastal habitats		X	

### Other relevant policy and guidance

6.5.2.16 In addition to compliance with the *NPSNN* and *NPPF*, this report has been written in accordance with professional standards and guidance. The standards and guidance which relate to the assessment are:

- *Guidance for Ecological Impact Assessment in the United Kingdom Third Edition* (Chartered Institute of Ecology and Environmental Management, 2018)<sup>13</sup>
- *Design Manual for Roads and Bridges (DMRB) LA 108 Biodiversity (DMRB LA 108)*, Revision 1, March 2020
- *DMRB LD 118 Biodiversity Design (DMRB LD 118)*, Revision 1, March 2020 (Highways England, 2020c)<sup>14</sup>

### 6.5.3 Methodology

#### Desk study

6.5.3.1 Desk study data was obtained in 2021 from the following Local Record Centres (LRC):

- Environmental Records Information centre (ERIC) North East
- Cumbria Biodiversity Data Centre (CBDC)
- North and East Yorkshire Ecological Data Centre (NEYEDC)

6.5.3.2 The study area was defined as follows with measurements taken from the nearest point of the Order Limits and desk study areas:

<sup>13</sup> Chartered Institute of Ecology and Environmental Management (2018) *Guidance for Ecological Impact Assessment in the United Kingdom Third Edition*

<sup>14</sup> Highways England (2020c) *Design Manual for Roads and Bridges LD 118 Biodiversity Design*, Revision 1, March 2020,

- 2km radius for international sites of nature conservation importance (or 30km for SAC where bats are noted as one of the qualifying interests)
- 2km radius for nationally designated sites of nature conservation importance
- 1 km radius for regional and local non-statutory designated sites
- 1 km radius for protected or notable species
- 1 km radius for Section 41 HoPI, Ancient Woodland Inventory (AWI) sites and veteran trees

6.5.3.3 In addition, designated site citations, site plans, management plans, and Site of Special Scientific Interest (SSSI) condition unit information was used where available. This information was taken from Natural England's *Designated Sites View* (Natural England, 2022)<sup>15</sup> and *MAGIC* (Department for Environment Food and Rural Affairs, 2022)<sup>16</sup>.

6.5.3.4 The desk study information was used to provide context and data for National Vegetation Classification (NVC) communities recorded within the study area and wider landscape. This provides further information on what is present to inform planting schedules. The results tables detail the location of each designated site for context.

#### Field survey

6.5.3.5 Initial Phase 1 survey information gathered in early 2021 was used to scope whether further NVC surveys were required.

6.5.3.6 One woodland NVC survey was undertaken in Temple Sowerby to Appleby in June 2021. This survey location and the five quadrat locations are shown on Figure 6.4: Hedgerow and National Vegetation Classification (Application Document 3.3). This was identified for further survey as part of the desk study scoping prior to undertaking Phase 1 surveys. The woodland was located along the bank tops of Trout Beck which forms part of the River Eden SAC, which is designated for supporting the Annex I habitat alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*. Consequently, this woodland was taken forward for further survey to confirm whether this woodland community was present.

#### National Vegetation Classification - Woodland

6.5.3.7 The NVC methodology for sampling vegetation in the field was followed (Rodwell, 2006)<sup>17</sup>. The standard sample uses a 50mx50m quadrat for trees and shrub data and a 4mx4m quadrat for the ground flora.

6.5.3.8 Due to site access restrictions and topography the standard sample NVC methodology was adjusted where necessary.

6.5.3.9 Five ground flora quadrat samples were taken within homogenous stands of vegetation within one canopy quadrat. The size and habitat

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<sup>15</sup> Natural England (2022) Designated Sites Viewx

<sup>16</sup> Department for Environment, Food and Rural Affairs (2022) MAGIC, x

<sup>17</sup> Rodwell, J.S. (2006) National Vegetation Classification: Users' handbook. Joint Nature Conservation Committee.

present within the woodland dictated the number canopy (tree and shrub) that could be sampled.

- 6.5.3.10 The Domin scale was used to identify the abundance of species within quadrats (Table 3: The Domin scale of cover/abundance) One quadrat sample was subsequently taken within stands that were deemed to be homogenous.
- 6.5.3.11 The frequency of each species across all quadrats was also calculated (Table 4: Frequency of species).
- 6.5.3.12 The size and habitat present within the woodland dictated the size, shape and number of 50m by 50m quadrats that could be sampled. Instead, it was decided in the field to survey a whole homogenous length between ground flora Quadrat 1 and Quadrat 5 as one contiguous narrow survey area as an alternative approach to the standard sample of 50m by 50m quadrat. Only one quadrat for trees and shrub data was used which was not a 50m by 50m square; the shape had to follow the topography of the narrow strip of woodland adjacent to the River Eden.
- 6.5.3.13 Due to access restrictions and steep topography the standard sample size of 4m by 4m was adjusted to 2m by 8m. In total five 2m by 8m ground flora quadrat samples were taken within homogenous stands of tree and shrub vegetation between ground flora Quadrat 1 and Quadrat 5.
- 6.5.3.14 The limitations of this adjusted approach are described in 6.5.4 Assumptions and Limitations.
- 6.5.3.15 The data was analysed using Volume 1, British Plant Communities (Rodwel et al., 1998)<sup>18</sup> supplemented with analysis using the MAVIS software (Smart et al, 2016)<sup>19</sup> to aid with assignment of potential woodland communities.

Table 3: The Domin scale of cover/abundance

Cover (%)	Domin
91-100	10
76-90	9
51-75	8
34-50	7
26-33	6
11-25	5
4-10	4
<4 (many individuals)	3
<4 (several individuals)	2

<sup>18</sup> Rodwell, J.S., Pigott, C.D., Ratcliffe, D.A., Malloch, A.J.C., Birks, H.J.B., Proctor, M.C.F., Shimwell, D.W., Huntley, J.P., Radford, E., Wigginton, M.J. and Wilkins, P. (1998) British Plant Communities, Volume 1, Woodlands and Scrub. Cambridge University Press.

<sup>19</sup> Smart, S., Goodwin, A., Wallace, H., and Jones, M. (2016) MAVIS (Ver 1.03). A computer program to aid the assignment of vegetation data to the communities and subcommunities of the National Vegetation Classification.

Cover (%)	Domin
<4 (few individuals)	1

Table 4: Frequency of species

Frequency (%) of species across quadrats	Frequency class	
1-20 (i.e. 1 stand in 5)	I	Scarce
21-40	II	Occasional
41-60	III	Common/frequent
61-80	IV	Constant
81-100	V	Constant

6.5.3.16 Additionally, a qualitative assessment using the DAFOR scale was used for the canopy cover of tree species (Table 5: DAFOR scale description). Table 1: NPSNN paragraphs of relevance to habitats and species of botanical interest

Table 5: DAFOR scale description

Abundance		Description
D	Dominant	Only used on an occasion where one species is the most common and well over three quarters of the square.
A	Abundant	For species that are very common across most of the square.
F	Frequent	For species which are in several places in the square. Or if the plant is only present in one part of the square but was very common in that part.
O	Occasional	For species that occur in several places in the square but whose populations are usually not very big.
R	Rare	For species that occur as a small number of individuals in the square.

## 6.5.4 Assumptions and limitations

6.5.4.1 Not all citations for statutory and non-statutory sites have assigned NVC communities for habitats that they support. The NVC is a standard for assigning a comprehensive classification to plant communities. The classification system is most frequently used for further botanical surveys where the habitat is likely to support a botanically rich community. Where no NVC community has been assigned this should not be taken to mean that botanically rich communities are not supported. In such instances a comment is made to confirm no formally assigned NVC community has been identified. In addition, the European sites utilise Annex I habitats to assign qualifying features which may cover a range of NVC communities. Furthermore, where an NVC community has been assigned, it does not necessarily mean that the community or condition are still in a condition where it is of relevance in the context of the Scheme. However, a precautionary approach is taken and where details of NVC communities which support species rich communities are identified and lie within 250m of the Order Limits, it is assumed that they are present.

6.5.4.2 The woodland survey undertaken in June 2021 in Temple Sowerby to Appleby was along a thin linear section of woodland adjacent to Trout

Beck. The woodland was located on the bank top of Trout Beck with a barbed wire fence restricting full access. Due to the size, shape, narrowness, access restrictions and steepness it was not possible in the field to collect data from a standard sample size of 50m by 50m. Instead, the methodology for taking canopy quadrats was amended such that a list of species was recorded to assess the different proportions and frequencies across the woodland.

6.5.4.3 The understorey and ground flora quadrats were also amended to a 2mx8m quadrat.

6.5.4.4 It is considered that the adjustments to the methodology to account for field conditions has not significantly altered the NVC results and that the NVC habitat classification type of W6 *Alnus glutinosa-Urtica dioica* woodland is accurate.

6.5.4.5 A precautionary approach has been taken and where desk study information regarding the presence of NVC communities were identified, it is assumed that these communities are present. Further surveys are scheduled during the 2022 survey season to ground truth assumptions.

## 6.5.5 Results

### Routewide

#### *Desk study*

6.5.5.1 A total of 22 NVC communities/subcommunities were identified routewide within the wider study area. This included a mix of grassland, woodland, mires, swamp and tall-herb fen and vegetation of open habitats. Details of each community and the location are detailed within each scheme.

#### *Field survey*

6.5.5.2 One site was subject to NVC surveys routewide, a woodland along Trout Beck in Temple Sowerby to Appleby This survey location and the five quadrat locations are shown on Figure 6.4: Hedgerow and National Vegetation Classification (Application Document 3.3). One community was recorded within this survey site, which was woodland. Details of the community and the location are detailed within the relevant scheme (Temple Sowerby to Appleby) and

### M6 Junction 40 to Kemplay Bank

#### *Desk study*

6.5.5.3 The following designated sites were identified within the study area within M6 Junction 40 to Kemplay Bank. The sites are designated for supporting habitats, however no formal NVC community has been assigned:

- River Eden Special Area of Conservation (SAC)
- River Eden and Tributaries Site of Special Scientific Interest (SSSI)

6.5.5.4 Table 6: Designated sites and NVC communities identified within the study area of M6 Junction 40 to Kemplay Bank. Table 6 outlines

designated sites and the NVC communities identified within the study area of M6 Junction 40 to Kemplay Bank.

Table 6: Designated sites and NVC communities identified within the study area of M6 Junction 40 to Kemplay Bank.

Designated site	Approximate location from Order Limits	NVC community						
		MG1	W9	M27	S22	S28	S29	OV26
Skirsgill Woods County Wildlife Site (CWS)	Within the Order Limits		X	X		X		
Yanwath Woods CWS	50m		X					
Myers Beck (Mardale Road) CWS	0.4km	X			X		X	X

### Penrith to Temple Sowerby

#### Desk study

6.5.5.5 The following designated sites were identified within the study area within Penrith to Temple Sowerby. The sites are designated for supporting habitats, however no formal NVC community has been assigned:

- River Eden SAC
- River Eden and Tributaries SSSI
- Udford Low Moss SSSI Whinfell Forest CWS
- Watersmeet (Eamont and Eden) CWS
- Tipperary and Dudford Woods ancient replanted woodland
- Salter Wood ancient replanted woodland.

6.5.5.6 No designated sites within Penrith to Temple Sowerby study area were identified with confirmed NVC communities.

### Temple Sowerby to Appleby

#### Desk study

6.5.5.7 The following designated sites were identified within the study area within Temple Sowerby to Appleby. The sites are designated for supporting habitats, however no formal NVC community has been assigned:

- River Eden and Tributaries SSSI
- Temple Sowerby Moss SSSI
- Chapel Wood ancient and semi-natural woodland
- Ross Wood ancient and semi-natural/ancient replanted woodland
- Oglebird Plantation ancient replanted woodland
- Dowpits Wood ancient and semi-natural woodland

6.5.5.8 Table 7: Designated sites and NVC communities identified within the study area of Temple Sowerby to Appleby. Table 7 outlines designated

sites and the NVC communities identified within the study area of Temple Sowerby to Appleby.

Table 7: Designated sites and NVC communities identified within the study area of Temple Sowerby to Appleby.

Designated site	Approximate location from Order Limits	NVC community							
		W6	W7	W8e	W8f	W9	W10	M27	S7
Acorn Bank Woods and Garden CWS	0.9km	X	X	X	X				
River Lyvennet Floodplain CWS	1.1km							X	X
Chapel Wood (Appleby in Westmorland) CWS	Within the Order Limits					X			
Ross Wood CWS	0.2km						X		
Dowpits Wood CWS	0.9km					X			

*Field survey*

6.5.5.9 The results of the NVC undertaken in June 2021 on the woodland which falls within the River Eden SAC adjacent to Trout Beck, are detailed in Table 8: DAFOR scale for canopy species and Table 9: Species abundance within quadrat samples and frequency across quadrats (floristic value). A calculation of the floristic value (frequency and abundance) across the quadrats is detailed.

Table 8: DAFOR scale for canopy species

Layer	Species	DAFOR value
Canopy	<i>Corylus avellana</i>	A
	<i>Crataegus monogyna</i>	A
	<i>Alnus glutinosa</i>	A
	<i>Fraxinus excelsior</i>	F
	<i>Sambucus nigra</i>	F
	<i>Prunus sp.</i>	F
	<i>Betula pendula x pubescens</i>	F
	<i>Acer pseudoplatanus</i>	F
	<i>Populus x canescens</i>	O
	<i>Populus tremula</i>	O
	<i>Salix caprea</i>	O
	<i>Betula pubescens</i>	O
	<i>Quercus robur</i>	O
	<i>Quercus petraea</i>	O
<i>Prunus avium</i>	O	



Layer	Species	DAFOR value
	<i>Sorbus aucuparia</i>	O
	<i>Populus balsamifera</i>	R
	<i>Salix cinerea</i>	R
	<i>Salix pentandra</i>	R
	<i>Salix viminalis</i>	R
	<i>Salix fragilis</i>	R
	<i>Betula pendula</i>	R
	<i>Sorbus aria</i>	R

Table 9: Species abundance within quadrat samples and frequency across quadrats (floristic value)

Layer	Species	Cover (Domin)					Floristic value
		Q1	Q2	Q3	Q4	Q5	
Understorey	<i>Crataegus monogyna</i>	2				1	II (1-2)
	<i>Rubus fruticosus</i> agg.	1					I (1)
	<i>Corylus avellana</i>					1	I (1)
	<i>Prunus</i> sp.					1	I (1)
Ground flora	<i>Alopecurus pratensis</i>	8	4			7	III (4-8)
	<i>Arrhenatherum elatius</i>	8	5	9	8	9	V (5-9)
	<i>Phleum pratense</i>	4	1				II (1-4)
	<i>Dactylis glomerata</i>	4	5		7	4	IV (4-7)
	<i>Poa pratensis</i>	4					I (4)
	<i>Poa nemoralis</i>	3					I (3)
	<i>Poa trivialis</i>		8	4	5	5	IV (4-8)
	<i>Galium aparine</i>	5	5	7	7	4	V (4-7)
	<i>Silene dioica</i>	4	4	4	4	2	V (2-4)
	<i>Urtica dioica</i>	4	6	7	7		IV (4-7)
	<i>Ficaria verna</i>	2					I (2)
	<i>Geranium robertianum</i>	2					I (2)
	<i>Aegopodium podagraria</i>	2					I (2)
	<i>Cruciata laevipes</i>	4	4		4		III (4)
	<i>Glechoma hederacea</i>	3					I (3)
	<i>Allium ursinum</i>	3		3			II (3)
	<i>Geum urbanum</i>	3					I (3)
	<i>Equisetum arvense</i>	1					I (1)
	<i>Taraxacum officinale</i> agg.	1					I (1)
	<i>Cirsium vulgare</i>		2				I (2)
<i>Cirsium arvense</i>		2		1		II (1-2)	
<i>Alliaria petiolata</i>		1				I (1)	



Layer	Species	Cover (Domin)					Floristic value
		Q1	Q2	Q3	Q4	Q5	
	<i>Ranunculus repens</i>		2			3	II (2-3)
	<i>Vicia sepium</i>		2			2	II (2)
	<i>Petasites hybridus</i>			4			I (4)
	<i>Myosotis</i> sp.			2			I (2)
	<i>Anthriscus sylvestris</i>			4			I (4)
	<i>Epilobium hirsutum</i>			1			I (1)
	<i>Heracleum sphondylium</i>				3		I (3)
	<i>Stellaria graminea</i>				3		I (3)
	<i>Rhytidadelphus squarrosus</i>	4					I (4)

6.5.5.10 The results show that the surveyed woodland shows greatest affinity to W6 *Alnus glutinosa-Urtica dioica*.

6.5.5.11 The woodland is a narrow strip, similar to a line of trees, with quite an open understorey with very little natural regeneration. The adjacent fields are heavily managed for agriculture.

#### Appleby to Brough

#### Desk Study

6.5.5.12 The following designated sites were identified within the study area within Appleby to Brough. The sites are designated for supporting habitats, however no formal NVC community has been assigned:

- George Gill SSSI
- Appleby Fells SSSI
- Helbeck Wood SSSI
- Swindale Wood SSSI
- Yosgill Wood ancient and semi-natural woodland
- Kiln Hill Wood ancient and semi-natural woodland

6.5.5.13 Table 10: Designated sites and NVC communities identified within the study area of Appleby to Brough outlines designated sites and the NVC communities identified within the study area of Appleby to Brough.

Table 10: Designated sites and NVC communities identified within the study area of Appleby to Brough

Designated site	Approximate location from Order Limits	NVC community							
		MG5	W7	W9	W10e	M23	M25c	S4	S25
Sandford Mire CWS	7m					X	X	X	X
Tricklebanks Wood CWS	1.2km		X		X				
Swindale Woodland CWS	1.3km	X		X					

## Bowes Bypass

### Desk Study

6.5.5.14 The following designated sites were identified within the study area within Bowes Bypass. The sites are designated for supporting habitats, however no formal NVC community has been assigned:

- Kilmond Scar SSSI.

6.5.5.15 Table 11: Designated site and NVC communities identified within the study area of Bowes Bypass outlines the designated site and the NVC community identified within the study area of Bowes Bypass.

Table 11: Designated site and NVC communities identified within the study area of Bowes Bypass

Designated site	Approximate location from Order Limits	NVC community								
		M2b	M3	M18a	M19a and b	M20a and b	M37	M38	H9	H12
North Pennine Moors SAC/Bowers Moor SSSI	0.2km	X	X	X	X	X	X	X	X	X

## Cross Lanes to Rokeby

### Desk Study

6.5.5.16 The following designated sites were identified within the study area within Cross Lanes to Rokeby. The sites are designated for supporting habitats, however no formal NVC community has been assigned:

- Kilmond Scar SSSI
- Brignall Banks SSSI
- Thorsgill Wood Local Wildlife Site (LWS)
- Rokeby Park - Castle Fetch LWS
- Waterfall Wood ancient and semi-natural woodland
- Mill Wood ancient and semi-natural/replanted woodland
- Tees Bank Plantation ancient and semi-natural woodland

6.5.5.17 No designated sites within Cross Lanes to Rokeby study area were identified with confirmed NVC communities.

## Stephen Bank to Carkin Moor

### Desk Study

6.5.5.18 The following designated site was identified within the study area within Stephen Bank to Carkin Moor. The site is designated for supporting habitats, however no formal NVC community has been assigned:

- Ravensworth Park - Castle Fetch LWS

6.5.5.19 Table 12: Designated sites and NVC communities identified within the study area of Stephen Bank to Carkin Moor outlines designated sites and the NVC communities identified within the study area of Stephen Bank to Carkin Moor.

Table 12: Designated sites and NVC communities identified within the study area of Stephen Bank to Carkin Moor

Designated site	Approximate location from Order Limits	NVC community				
		W8	W9	W10	W16	W25
Aske Estate Woodlands LWS	0.9km	X	X	X	X	X

### A1(M) Junction 53 Scotch Corner

#### Desk Study

6.5.5.20 The following designated site was identified within the study area within A1(M) Junction 53 Scotch Corner. The site is designated for supporting habitats, however no formal NVC community has been assigned:

- Black Scar Quarry SSSI.

6.5.5.21 No designated sites within Cross Lanes to Rokeby study area were identified with confirmed NVC communities.

#### Future baseline

6.5.5.22 The ecological baseline conditions described above represent those which currently exist in the absence of the scheme and at the time of writing. As stated in section 3 of Chartered Institute Ecology and Environmental Management (CIEEM)'s Guidelines for Ecological Impact Assessment in the UK and Ireland (Chartered Institute of Ecology and Environmental Management, 2019)<sup>20</sup>, potential changes in baseline conditions also need to be identified in order to assess impacts.

6.5.5.23 Based on the above information and current land use, the future baseline in the absence of the scheme is unlikely to change significantly. Subtle changes are expected due to climate change, such as some movements of certain species and local population changes, however, the overall habitats and species composition in the study area are expected to be broadly similar to that of the existing baseline. Therefore, the future baseline would remain the same as set out in the existing baseline.

### 6.5.6 Discussion

6.5.6.1 The NVC results of the woodland at Temple Sowerby to Appleby show that the woodland classification is W6 *Alnus glutinosa-Urtica dioica*. This is also Wet Woodland Priority habitat.

6.5.6.2 It is considered that the surveyed woodland is W6 *Alnus glutinosa-Urtica dioica* woodland, but not Annex I (91E0) habitat (Alluvial forest with *Alnus glutinosa* and *Fraxinus excelsior*). The surveyed woodland is a narrow strip of woodland, similar to a line of trees, on a steep slope between the River Eden and surrounding land used for agriculture, which is heavily managed. The woodland has quite an open sparse understorey with very little natural regeneration. The Irish Wildlife

<sup>20</sup> Chartered Institute of Ecology and Environmental Management (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater Coastal and Marine

Manual No.71<sup>21</sup> sets out how Annex 91E0 can be classified, which requires at least one target species, which the surveyed woodland has, but then more than six positive indicators, which the surveyed woodland does not have. The woodland is characteristic of having rich soils from alluvial deposits, however the adjacent agricultural land use is likely to have a negative impact on the W6 woodland.

- 6.5.6.3 A total of 22 NVC communities/subcommunities were identified routewide. This included a mix of grassland, woodland, mires, swamp and tall-herb fen and vegetation of open habitats.
- 6.5.6.4 The following sites were identified within 250m of the Order Limits and are subsequently most likely to be directly or indirectly impacted by construction or operation:
- River Eden SAC
  - North Pennine Moors SAC
  - Bowes Moor SSSI
  - River Eden Tributaries SSSI
  - Temple Sowerby Moss SSSI
  - Skirsgill Woods CWS
  - Yanwath Wood CWS
  - Myers Beck (Mardale Road) CWS
  - Whinfell Forest CWS
  - Chapel Wood (Appleby in Westmorland) CWS
  - Ross Wood CWS
  - Sandford Mire CWS
  - Rokeby Park and Mortham Wood LWS.
- 6.5.6.5 The NVC communities recorded within these sites include a mix of grassland, woodland, mires, swamp and tall-herb fen and vegetation of open habitats.
- 6.5.6.6 NVC surveys are being planned based on all the Phase 1 habitat survey data collected and are due to commence during the survey season in 2022. These surveys will inform detailed planting schedules, landscaping proposals, and mitigation.

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<sup>21</sup> O'Neill, F.H. & Barro, S.J. (2013) Results of monitoring survey old sessile oak woods and alluvial forests. Irish Wildlife Manuals, No. 71. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland