A66 Northern Trans-Pennine Project
TR010062

3.4 Environmental Statement Appendix 6.2 Designated Sites

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

3.4 ENVIRONMENTAL STATEMENT APPENDIX 6.2 DESIGNATED SITES

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6.2 Designated Sites

6.2.1 Introduction

6.2.1.1 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.

6.2.1.2 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.

6.2.1.3 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. For a full project description see ES Chapter 2: The Project (Application Document 3.2).

Scope of the Document

6.2.1.4 This report presents desk study data and baseline survey results relating to Designated Sites. This includes designated sites located within the study area surrounding the Order Limits of the Project and Designated Sites located within the study area surrounding the Affected Road Network (ARN). For a full description of the ARN see Chapter 5: Air Quality (Application Document 3.4).

6.2.1.5 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 Designated Sites 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.

6.2.2 Legislation and Policy Framework

Legislation

The Conservation of Habitats and Species (CHS) Regulations 2017 (as amended by the EU Exit Regulations 2019) (the 'Habitat Regulations 2017')

6.2.2.1 The Habitats 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 Wildlife and Countryside Act (WCA) 1981 (as amended).

6.2.2.2 The Habitats Regulations 2017 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.

6.2.2.3 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 as protected under the Habitats Regulations 2017. It does however introduce amendments in light of the United Kingdom's withdrawal from the European Union, including to change the nomenclature of the protected sites network within the UK. The Natura 2000 site network, comprising SPAs, SACs and Ramsar sites is now titled the National Sites Network within the UK. The National Sites Network does not include Ramsar sites however it is noted[1] that many Ramsar sites overlap with SAC and SPA sites and all Ramsar sites continue to be protected in the same way as SACs and SPAs.

Ramsar Convention on Wetlands (United Nations Educational, Scientific Cultural Organisation, 1971)

6.2.2.4 As briefly set out above, Ramsar Sites are wetlands of international importance that have been designated under the criteria of the Ramsar Convention on Wetlands for containing representative, rare or unique wetland types or for their importance in conserving biological diversity.

6.2.2.5 UK Ramsar Sites are generally also designated as Sites of Special Scientific Interest (SSSIs), SPAs or SACs. Accordingly, these receive statutory protection under the WCA or the Habitats Regulations 2017. The UK Government has also issued policy statements relating to Ramsar Sites which extend to them the same protection at a policy level as SACs and SPAs [1].

Wildlife and Countryside Act (WCA) 1981 (as amended)

6.2.2.6 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 SSSI. It confers differing levels of protection on species themselves, their habitats, or both, depending on their conservation status.

6.2.2.7 Species offered protection by the WCA 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 Act lists plants which are afforded protection under the section 13 of the WCA 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 uproot any wild plant not included in that Schedule.

[1] Policy paper 'Changes to the Habitats Regulations 2017' published by Defra on 1 January 2021

Natural Environment and Rural Communities (NERC) Act 2006 (particularly the section 41 list of habitats and species of Principal Importance for Conservation (referred to as Priority Habitats or Species in this report))

6.2.2.8 The UK Biodiversity Action Plan (UKBAP) covering 2011-2020 has been superseded by the UK Post-2010 Biodiversity Framework. The Framework identifies 65 Priority Habitats and 1150 Priority Species that are in need of protection from activities that threaten their long-term survival. 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.

6.2.2.9 Section 41 includes 402 vascular and non-vascular plants and 56 Habitats of Principle Importance (HoPI) (Natural England, 2022)[2].

6.2.2.10 All planning decisions must be made with regard for the conservation of Section 41 List species and habitats and any priority actions (Natural England, 2014)[3] associated with them. Priority actions include habitat management, policy or legislation, survey or monitoring, research, species management, and education or awareness raising.

Environment Act 2021

6.2.2.11 The Environment Act 2021 received Royal Assent on 9th November 2021 and is expected to become fully mandated within the next years. The act creates a post Brexit framework to protect and enhance the natural environment. Through amendments to the Town and Country Planning Act 1990, the Act will require all planning permissions in England to be granted subject to a new general pre-commencement condition that requires approval of a biodiversity net gain plan. This will ensure the delivery of a minimum of 10% measurable biodiversity net gain. The key tool to calculate this will be the Defra Biodiversity 3.0 Metric. Works to deliver biodiversity net gain can be carried out either onsite or offsite or through the purchase of 'biodiversity credits' from the Secretary of State. However, this flexibility may be removed (subject to regulations) if the onsite habitat is 'irreplaceable'. Both onsite and offsite enhancements must be maintained for at least 30 years after completion of any development.

National level policy

National planning statement for national networks

6.2.2.12 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)[4], which sets out policies to guide how DCO applications will be decided and how the effects of national networks infrastructure should be considered by

[2] Natural England (2022) Habits of principle importance
[3] Natural England (2014) Priority Actions for S41 Species,
[4] Department for Transport (2014) National Policy Statement for National Networks]

the relevant decision maker *(being in this case, the Secretary of State for Transport)*. The policies for biodiversity and ecological conservation include statements that:

"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)

6.2.2.13 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).

6.2.2.14 Table 1: Relevant *NPSNN* policies details relevant *NPSNN* policies.

Table 1: Relevant *NPSNN* policies

Relevant *NPSNN* paragraph reference	Requirement of the *NPSNN* (paraphrase)
5.22	Ensure environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside England) 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	The applicant should show how the Project has taken advantage of opportunities to conserve and enhance biodiversity conservation interests.
5.29	Where a proposed development on land within or outside a SSSI is likely to have an adverse effect on an SSSI (either individually or in combination with other developments), development consent should not normally be granted. Where an adverse effect on the site's notified special interest features is likely, an exception should be made only where the benefits of the development at this site clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs. The Secretary of State should ensure that the applicant's proposals to mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity are acceptable.
5.31	Sites of regional and local biodiversity interest (including Local Nature Reserves, Local Wildlife Sites, and Nature Improvement Areas) have a fundamental role to play in meeting overall national biodiversity targets, in contributing to the quality of life and the well-being of the community, and in supporting research and

Relevant *NPSNN* paragraph reference	Requirement of the *NPSNN* (paraphrase)
	education. The Secretary of state should give due consideration to such regional or local designations. However, given the need for new infrastructure, these designations should not be used in themselves to refuse development consent.
5.32	Ancient woodland is a valuable biodiversity resource for both its species diversity and its longevity as woodland. Once lost it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this.
5.33	Development proposals potentially provide many opportunities for building in beneficial biodiversity features as part of good design. When considering proposals, the Secretary of State should consider whether the applicant has maximised such opportunities in and around developments. The Secretary of State may use requirements or planning obligations where appropriate in order to ensure that such beneficial features are delivered.
5.34 and 5.35	Many 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 and therefore requiring conservation action. The Secretary of State should ensure that applicants have taken 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. In particular, the applicant should demonstrate that: • during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works; • during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised (including as a consequence of transport access arrangements); • habitats will, where practicable, be restored after construction works have finished; • developments will be designed and landscaped to provide green corridors and minimise habitat fragmentation where reasonable; • opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals, for example through techniques such as the 'greening' of existing network crossing points, the use of green bridges and the habitat improvement of the network verge.
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 *NPSNN* paragraph reference	Requirement of the *NPSNN* (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

6.2.2.15 The *National planning policy framework (NPPF*) (Ministry of Housing, Communities & Local Government, 2021)[5] 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[6]".*

6.2.2.16 Section 180 and 181 of the *NPPF* state:

180. When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons (for example, infrastructure projects (including nationally significant infrastructure projects) where the public benefit would clearly outweigh the loss or deterioration of habitat) and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for

[5] Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework
[6] Nationally Significant Infrastructure Projects (NSIP). HM Government (2008) Planning Act 2008, s

biodiversity or enhance public access to nature where this is appropriate.

181. The following should be given the same protection as habitats sites:

a) potential Special Protection Areas and possible Special Areas of Conservation;

b) listed or proposed Ramsar sites; and

c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

Regional and local level policy

6.2.2.17 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)[7].

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

- *Eden Local Plan (2014-2032)* (Eden District Council, 2014)[8] Policy ENV1 and Policy ENV2[8]
- *County Durham Plan (Adopted 2020)* (Durham County Council, 2020)[9] Policy 26, Policy 40, Policy 41, Policy 42 and Policy 43
- *Richmondshire Local Plan (2012-2028)* adopted 2014 (Richmondshire District Council, 2014)[10] Core Policy CP12
- *Cumbria BAP* (Cumbria Biodiversity Partnership, 2001)[11].
- Durham County Council BAP (2012/13) now listed on North East England Nature Partnership (North East England Nature Partnership, 2013)[12] .
- Richmondshire District Councils BAP (Richmond County Council, 2014)[13].

Other relevant policy and guidance

6.2.2.19 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:

[7] DEFRA (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services. Department for Environment, Food and Rural Affairs, London.
[8] Eden District Council (2014) Eden Local Plan 2014 to 2032]
[9] Durham Council (2020) County Durham Plan – Adopted 2020]
[10] Richmond County Council (2014) Richmondshire Local Plan 2012 - 2028 Core Strategy (Adopted 9 December 2014)2
[11] Cumbria Biodiversity Partnership (2001) The Cumbria Biodiversity Action Plan]
[12] North East England Nature Partnership (2013) Biodiversity Priorities]
[13] Richmond County Council (2014) Richmondshire Biodiversity Action Plan]

- *Guidance for Ecological Impact Assessment in the United Kingdom Third Edition* (Chartered Institute of Ecology and Environmental Management, 2018)[14]
- *Design Manual for Roads and Bridges) DMRB) LA 108 Biodiversity (DMRB LA 108*), Revision 1, March 2020[15]
- *DMRB LD 118 Biodiversity Design (DMRB LD 118),* Revision 1, March 2020 (Highways England, 2020)[16]

6.2.3 Methodology

Desk study

6.2.3.1 Desk study data (site boundaries and citations) within 2km of the Order Limits of the Project was obtained in 2020 and 2021 from the following Local Record Centres (LRC):

- Environmental Records Information Centre (ERIC) North East
- Cumbria Biodiversity Data Centre (CBDC)
- Lancashire Environment Record Network (LERN)
- North and East Yorkshire Ecological Data Centre (NEYEDC)

6.2.3.2 The Woodland Trust supplied data from the Ancient Tree Inventory within 1km of the Order Limits of the Project.

6.2.3.3 Natural England also supplied data: *Conservation Objectives and definitions of favourable condition for designated features of interest* for the North Pennine Moors SAC/SPA and Bowes Moor SSSI.

6.2.3.4 The following publicly available information was also reviewed:

- Centre for Ecology and Hydrology website layer: *Countryside Survey* 2007 data layer (reviewed for Phase 1 habitat data for sites outside of Phase 1 habitat survey field survey) (UK Centre for Ecology & Hydrology, 2021)[17]
- European Site Conservation Objectives: Supplementary advice on conserving and restoring site features[18][19]
- *Multi-Agency Geographic Information for the Countryside (MAGIC)* data (Department for Environment, Food and Rural Affairs, 2022)[20] to identify SSSI units and their current condition, citation data, potentially damaging operations and views about management.

6.2.3.5 The study area was defined as follows with measurements taken from the nearest point from the Order Limits. These areas are shown on ES

[14] Chartered Institute of Ecology and Environmental Management (2018) Guidance for Ecological Impact Assessment in the United Kingdom Third Edition
[15] Highways England (2020) Design Manual for Roads and Bridges LD 108 Biodiversity Design, Revision 1, March 2020]
[16] Highways England (2020c) Design Manual for Roads and Bridges LD 118 Biodiversity Design, Revision 1, March 2020]
[17] UK Centre for Ecology & Hydrology (2021) 'Countryside Survey']
[18] Natural England (2022) 'Conservation objectives for European Sites: North East'.
[19] Natural England (2022) 'Conservation objectives for European Sites: North West'.
[20] Department for Environment, Food and Rural Affairs (2022) Multi-Agency Geographic Information for the Countryside interactive map,

Figure 6.1: Statutory and Non-Statutory Designated Sites, ES Figure 6.2: Ancient Woodland, Ancient Tree Inventory and Priority Habitats and ES Figure 5.1: Air Quality Study Area (Application Document 3.3)).

- Statutory designated sites within 2km of the Project
- Statutory designated sites within 200m of the ARN
- Non-statutory designated sites within 1km of the Project
- Non-statutory designated sites within 200m of the ARN
- Ancient woodlands within 1km of the Project
- Ancient woodlands within 200m of the ARN
- Veteran, ancient, or notable trees within 1km of the Project[21][22]
- Veteran, ancient or notable trees within 200m of the ARN

6.2.3.6 Site citations (where available) were reviewed for information regarding the reasons for designation, notes on habitats and species interests, condition and vegetative communities present.

6.2.3.7 Reviews were made of Phase 1 habitat survey data to identify areas of woodland that may qualify as potential areas of ancient woodland. Additional detail from Phase 1 habitat survey data and hedgerow surveys from 2020 and 2021 was reviewed to identify likely vegetative communities, confirmation of existing or the additional presence of protected or otherwise noteworthy species or habitats, habitat condition, extent or geographical context.

6.2.4 Assumptions and Limitations

6.2.4.1 Statutory sites, for example SSSI and locally designated sites such as CWS, that are designated primarily for their geological interest are included where they have secondary biodiversity related interest or support HoPI following the desk study review.

6.2.4.2 Non-statutory designated sites naming varies routewide as summarised below:

- Lancashire - non-statutory designated sites are named Biological Heritage Sites (BHS)
- Cumbria - non-statutory designated sites are named are named as either County Wildlife Sites (CWS), Special Roadside Verges, or Sites of Invertebrate Significance (SIS)
- North East Yorkshire, Durham and Richmond - non-statutory designated sites are named Local Wildlife Sites (LWS).

6.2.4.3 The River Eden SAC and River Eden and Tributaries SSSI designation citation includes the following Annex 1 habitat: Clear water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels: Oligotrophic to mesotrophic standing waters with vegetation of the (*Littorelletea uniflorae)* and/or of the (*Isoëto-Nanojuncetea)*; and the fish

[21] Study areas used are in accordance with industry standards and guidance - see ES Chapter 6: Biodiversity (Application Document 3.2) for further details.
[22] Veteran, ancient or notable trees have been identified and defined within the study area using girth size in accordance with the following published guidance: Woodland Trust (2008) Ancient Tree Guide 4: 'What are ancient, veteran and other trees of special interest' f

species schelly (*Coregonus laevigatus*) (Table 2: Statutory designated sites). These designated features are known to be associated specifically with lake habitat at Ullswater and are not known to exist within 2km of the Project. This was confirmed following the statutory consultation response received on the Stage 1 HRA Screening Report where these designated features were screened out of the assessment (See Habitat Regulations Assessment Stage 1: Likely Significant Effects Report (Application Document 3.5 for further details). Consequently, these designated features are not discussed in detail within this report and Limekiln Wood LWS within 200m of the ARN (A1(M) south of Scotch Corner).

6.2.4.4 Non-statutory sites supplied as de-notified sites have not been included in this report and include Stephen Bank Road Verge LWS in the Stephen Bank to Carkin Moor scheme.

6.2.4.5 Site citations were available for many of the sites but are not exhaustive. Field survey data, where available, was used to supplement designated site citations where appropriate. Similarly, it is noted that Woodland Trust data layers are not exhaustive for ancient woodlands or ancient, veteran or notable trees. It is also possible that the condition, size and presence of a certain tree may have changed since the survey data has been collected in the field. These records were supplemented using field survey data, where available and where appropriate.

6.2.5 Results

Routewide

Statutory Designated Sites

6.2.5.1 There are 18 statutory designated sites within 2km of the Project, of which five are also within 200m of the ARN. A further additional five statutory sites are also located within 200m of the ARN (Table 2: Statutory designated sites; Table 3: Statutory designated sites within 200m of the ARN only; ES Figure 6.1: Statutory and Non-statutory Designated Sites; and Figure 5.1: Air Quality Study Area (Application Document 3.3).

Table 2: Statutory designated sites within 2km of the Project

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
River Eden SAC NY462237	Qualifying habitats (Annex 1 priority habitats have an asterisk*): • Clear water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels: Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* • Rivers with floating vegetation often dominated by water crowfoot: Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation • Alder woodland on floodplains: Alluvial forests with alder (*Alnus glutinosa*) and ash (*Fraxinus excelsior*) (*Alno-Padion, Alnion incanae, Salicion albae*)*. Annex II species that are a primary reason for selection of this site: • Otter (*Lutra lutra*) • Sea lamprey (*Petromyzon marinus*) • Brook lamprey (*Lampetra planeri*) • River lamprey (*Lampetra fluviatilis*) • Atlantic salmon (*Salmo salar*) • Bullhead (*Cottus gobio*) • White-clawed (or Atlantic stream) crayfish (*Austropotamobius pallipes*).	Connected either by the river habitat passing under the A66 or for part of its length being adjacent to the Project and the ARN	M6 Junction 40 to Kemplay Bank (*within, south*) Penrith to Temple Sowerby (*within, west*) Temple Sowerby to Appleby (*within*) Appleby to Brough (377m, south/south-west) Within 200m of the ARN: immediately adjacent to the M6 at Carlisle; to the A6 south of Penrith, adjacent to Bessygill Wood; M6 A6 south of Penrith/ north of Thrimby and south of Thrimby
River Eden and Tributaries SSSI NY462237	River on sandstone and hard limestone that supports a diverse aquatic flora (one of the most diverse in Britain) with mesotrophic and oligiotrophic waters.	Connected either by the river habitat passing under the A66	M6 Junction 40 to Kemplay Bank (*within, south*)

[23] 'Connectivity' is a review of the presence of connective semi-natural habitats between the designated site and the Order Limits/ARN, including the identification of any barriers limiting connectivity.
[24] Also including statutory designated sites located within 200m of the ARN where the ARN falls within 2km of the Project

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
	Notifiable features: • Floating vegetation of plain and sub-mountainous rivers • Lowland wetland / floodplain fen • Otter • Sand martin (comprising the largest number of breeding sand martin in Cumbria) • Breeding bird assemblage • High diversity of breeding birds associated with riparian habitats (including dipper and grey wagtail) • Atlantic salmon • Brook lamprey • River lamprey • Sea lamprey • Bullhead • Schelly (*Coregonus stigmaticus*) • White-clawed crayfish • High invertebrate interest for species associated with river shingles and sandbanks • Geological feature: non-marine Permian Triassic (Red Beds)	or for part of its length being adjacent to the Project and the ARN	Penrith to Temple Sowerby (*within, west*) Temple Sowerby to Appleby (*within*) Appleby to Brough (377m, south/south-west) Within 200m of the ARN: immediately adjacent to the M6 at Carlisle; to the A6 south of Penrith, adjacent to Bessygill Wood; M6 A6 south of Penrith/ north of Thrimby and south of Thrimby
Cowraik Quarry SSSI NY542 230	This site is designated for its red sandstone quarry faces, as geological features. As non-designatory features the site also supports deciduous woodland and lowland heathland, both HoPI.	This site is disconnected from the Project with the barriers of the Penrith conurbation, Beacon Edge road and the A686 Carleton Avenue	M6 Junction 40 to Kemplay Bank (1.6km, north) Penrith to Temple Sowerby (1.7km, north)

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
		and the River Eden all forming barriers.	
Cowraik Quarry Local Nature Reserve (LNR) NY542 230	Notifiable features: • Red squirrel (Sciurus vulgaris) • Deciduous woodland (oak-birch woodland) • Heathland • Many bird species including redstarts (Phoenicurus phoenicurus), crossbill (Loxia curvirostra), tree-creeper (Certha familiaris), great spotted woodpecker (Dendrocopos major) and green woodpecker (Picus viridis) • Invertebrate species: green tiger beetle (Cincidela campestris), slender mining bee (Lasioglossum calceatum), field digger wasp (Mellinus arvensis), eyed ladybird (Anatis ocellata) and hoverfly species (Chriorhina floccosa and C.ascilica). Presence of the Habitats of Principal Importance: deciduous woodland and potentially on the presence of heathland.	This site is disconnected from the Project with the barriers of the Penrith conurbation, Beacon Edge road and the A686 Carleton Avenue and the River Eden all forming barriers.	M6 Junction 40 to Kemplay Bank (1.6km, north) Penrith to Temple Sowerby (1.7km, north)
Helbeck and Swindale Woods SAC NY785164	Annex I habitats that are a primary reason for selection of this site: • Tilio-Acerion forests of slopes, screes and ravines* Priority feature	Connected via semi-natural habitats and farmland.	Appleby to Brough (427m, north)
Moor House-Upper Teesdale SAC NY799358	Annex I habitats that are a primary reason for selection of this site: • Hard oligo-mesotrophic waters with benthic vegetation of Chara spp • Alpine and Boreal heaths • Juniper (Juniperus communis) formations on heaths or calcareous grasslands • Calaminarian grasslands of the Violetalia calaminariae • Siliceous alpine and boreal grasslands	Connected via semi-natural habitats and farmland.	Appleby to Brough (902m, north)

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) • Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels • Mountain hay meadows • Blanket bogs • Petrifying springs with tufa formation (Cratoneurion) *Priority feature • Alkaline fens • Alpine pioneer formations of the Caricion bicoloris-atrofuscae* Priority feature • Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) • Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) • Calcareous rocky slopes with chasmophytic vegetation • Siliceous rocky slopes with chasmophytic vegetation • Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • European dry heaths • Limestone pavements *Priority feature • Annex II species that are a primary reason for selection of this site: • Round-mouthed whorl snail (Vertigo genesii) • Marsh saxifrage (Saxifraga hirculus)		

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
North Pennines Moors SAC SE137749	Annex I habitats that are a primary reason for selection of this site: • European dry heaths • Juniper (Juniperus communis) formations on heaths or calcareous grasslands • Blanket bogs (* if active bog) *Priority feature • Petrifying springs with tufa formation (Cratoneurion) *Priority feature • Siliceous rocky slopes with chasmophytic vegetation • Old sessile oak woods with Ilex and Blechnum in the British Isles • Annex I habitats present as a qualifying feature, but not a primary reason for selection of site: • Northern Atlantic wet heaths with cross-leaved heath (Erica tetralix) • Calaminarian grasslands of the Violetalia calaminariae • Siliceous alpine and boreal grasslands • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) • Alkaline fens • Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) • Calcareous rocky slopes with chasmophytic vegetation Annex II species present as a qualifying feature, but not a primary reason for site selection: • Marsh saxifrage	Connected via semi-natural habitats and farmland to the western periphery of the Bowes Scheme and associated ARN	Bowes Bypass (255m, north-west) Within 200m of the ARN
North Pennine Moors Special Protection Area (SPA)	Qualifying features: • Golden plover (Pluvialis apricaria) • Hen harrier (Circus cyaneus) • Merlin (Falco columbarius)	Connected via semi-natural habitats and farmland to the western	Appleby to Brough (902m north), Bowes Bypass (255m north- west)

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
NY892194	• Peregrine (Falco peregrinus) • Curlew (Numenius arquata) • Dunlin (Calidris alpina schinzii) Non-qualifying species of interest: • Montagu's harrier (Circus pygargus) • Short-eared Owls (Asio flammeus)	periphery of the Bowes Scheme Connected and immediately north and south of the ARN between the Appleby to Brough and Bowes Bypass schemes	Within 200m of the ARN
Udford Low Moss SSSI NY582301	Notifiable features: • Fen and carr-woodland communities as one of the few intact valley fens in eastern Cumbria • Tall fen and diverse fen grassland • Wet (willow and alder) and dry woodland (ash, or oak-birch), some semi-natural and ancient in origin • Breeding records for redshank, water rail, snipe, reed bunting, sedge warbler and marsh tit • Presence of red squirrel	Connected distantly via farmland and semi-natural habitats to the Order Limits	Penrith to Temple Sowerby (923m north)
Temple Sowerby Moss SSSI NY616270	Notifiable features: • The development of species-rich fen communities • A fringe carr, dominated by alder, grey willow (Salix cinerea) and bay willow (S. pentandra) • Aquatic invertebrates include the water beetle (Laccornis oblongus), which is a rare species within the United Kingdom	Connected via farmland and semi-natural habitats to the Order Limits.	Temple Sowerby to Appleby (143m north-west)
George Gill SSSI NY718188	Geological SSSI designated for geological features, but also has ecological interest within broad-leaved and coniferous plantation and upland heathland, the latter of which is classed as a Habitat of Principal Importance.	Connected via semi-natural heathland habitats to the north-	Appleby to Brough (395m north-west)

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
		western end of the Order Limits.	
Appleby Fells SSSI NY760250	Notifiable features: • Blanket mire has developed over most of the ground and represents the most extensive habitat within the Appleby Fells • Agrostis-Festuca grassland occurs along steep, partially screed slopes around the limestone scars. Blue moor-grass (Sesleria caerulea) species predominates the area in association with spring sedges (Carex caryophyllea) and glaucous sedges (C.flacca). • Tall herb vegetation is a further important feature of the SSSI • Throughout the altitudinal range of the Appleby Fells, particularly at the periphery of the peat bog, there are numerous base-rich flushes • The site supports a large variety of breeding bird species • The site also provides hibernation sites for Brandts (Myotis brandti) and Whiskered bats (Myotis mystacinus) within the mine shafts that are present. • Associated sites: within part of the North Pennine Moors SAC and SPA, and Moor House Upper Teesdale SAC, Yosgill Woods ancient woodland, Helbeck Wood Site of Invertebrate Significance (SIS), adjacent to Helbeck and Swindale Woods SAC, Swindale Wood SIS, Swindale ancient woodland.	Connected distantly to the Order Limits via farmland and semi-natural habitats.	Appleby to Brough (902m north)
Helbeck Wood SSSI NY785164	Notifiable features: • Considered by some as one of the best ash-elm wood on limestone left in England • Dominant ash (Fraxinus excelsior) tree species • Rich herb communities including dog's mercury (Mercurialis perennis) and ramsons (Allium ursinum)	Connected via farmland and semi-natural habitats to the Order Limits.	Appleby to Brough (428m north)

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
	• Presence of lichen species which are characteristic of an ancient woodland • Presence of two small artificial tarns • Large breeding bird population. Associated sites: within Helbeck and Swindale Woods SAC, part of the North Pennine Moors SAC and SPA, and Moor House Upper Teesdale SAC, Yosgill Woods ancient woodland, Helbeck Wood SIS, adjacent to, Appleby Fells SSSI, connected to Swindale Wood SIS, Swindale ancient woodland.		
Swindale Wood SSSI NY804163	Notifiable features: • Dominant ash (Fraxinus excelsior) tree species • Rich herb communities including dog's mercury (Mercurialis perennis) and ramsons (Allium ursinum) • Presence of lichen species which are characteristic of an ancient woodland • Large breeding bird population.	Connected distantly via semi-natural habitats and farmland, the village of Brough forming a partial barrier terrestrially, but other links via watercourse connections	Appleby to Brough (1.3km north-east)
Bowes Moor SSSI NY923104	Notifiable features: • Bowes Moor SSSI meets the criteria for designation under the terms of the European Community Directive 79/409/EEC on the Conservation of Wild Birds, in particular moorland birds • Drier parts of the blanket bog support areas dominated by species such as heather • Shallower peats and drier mineral soils support heathland.	Connected via semi-natural habitats and farmland to the western periphery of the Bowes Bypass scheme. Connected and immediately north and south of the ARN between the Appleby to Brough and Bowes Bypass schemes.	Bowes Bypass (255m north-west) Within 200m of the ARN

Site name, designation, location	Reason for designation	Connectivity[23]	Schemes within 2km[24]
Kilmond Scar SSSI NZ028134	Notifiable features: • On the shallow soils which are prone to drought, rock ledges, crevices and scree, open vegetation contains a well-developed moss layer, which contains an abundant number of drought tolerant annual and perennial species, including biting stonecrop (Sedum acre) • Deeper limestone soils support grassland species. The most common of which are common bent (Agrostis capillaris) and red fescue (Festuca rubra).	Connected via farmland and semi-natural habitats to the Order Limits of Bowes Bypass scheme and more distantly to the Order Limits for the Cross Lanes to Rokeby scheme.	Bowes Bypass (410m south-east) Cross Lanes to Rokeby (1.4km north-east)
Brignall Banks SSSI NZ063113	Notifiable features: • Largely unmanaged species-rich woodland • On base-rich soils wych elm (Ulmus glabra) and ash (Fraxinus excelsior) mainly dominate the area • With mature tree on the more acidic soils. • The site supports a varied bryophyte and lichen flora, including several lichens which are sensitive to air pollution and are rare in Durham County • There is a diverse range of woodland bird species including great spotted woodpecker (Dendrocopos major).	Connected via farmland and semi-natural habitat to the western end of the Order Limits.	Cross Lanes to Rokeby (571m south-east)
Black Scar Quarry SSSI NZ231052	Geological SSSI supporting dense woodland habitat as a non-qualifying feature which is classified as a Habitat of Principal Importance.	Connected - via hedgerows and farmland to the southbound verge of the A1(M)	A1(M) Junction 53 Scotch Corner (1.2km east).

Table 3: Statutory designated sites within 200m of the ARN only

Site name, designation, location	Reason for designation	Connectivity[25]	Within 200m of the ARN
Asby Complex SAC NY598112	Qualifying habitats (Annex 1 priority habitats have an asterisk*): Calcium-rich springwater-fed fens: Alkaline fens; Calcium-rich fen dominated by great fen sedge (saw sedge); Calcareous fens with Cladium mariscus and species of the Caricion davallianae*; European dry heaths; Calcium-rich nutrient-poor lakes, lochs and pools: Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.; Limestone pavements*; Purple moor-grass meadows: Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae); Hard-water springs depositing lime: Petrifying springs with tufa formation (Cratoneurion)*; Dry grasslands and scrublands on chalk or limestone: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia). Annex II species that are a primary reason for selection of this site: Geyer's whorl snail (Vertigo geyeri).	Connected – immediately adjacent to the ARN / M6 verge.	Within 200m of the M6 (south of Penrith) ARN, at Oddendale.
Crosby Ravensworth Fell SSSI NY605105	This site lies both partially within and adjacent to Asby Complex SAC designation and where within the SAC boundary it supports the following consistent qualifying features: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia). (Dry grasslands and scrublands on chalk or limestone) (54.6ha);	Connected – immediately adjacent to the M6 ARN northbound and southbound verges.	Within 200m of the M6 (South of Penrith) ARN (at Oddendale)

[25] 'Connectivity' is a review of the presence of connective semi-natural habitats between the designated site and the Order Limits/ARN, including the identification of any barriers limiting connectivity.

Site name, designation, location	Reason for designation	Connectivity[25]	Within 200m of the ARN
	Alkaline Fens (Calcium-rich springwater-fed fens) (42.2ha); Limestone Pavements*(16ha); European dry heaths (1478.3ha); And the species: Geyer's whorl snail (Vertigo geyeri) In addition, this SSSI supports one of the few remaining areas of lowland heathland in Cumbria. Other habitats which contribute to the overall value of the site include calcareous and acid grasslands and base-rich flushes. The site also supports an assemblage of typical moorland breeding birds such as golden plover (Pluvialis apricaria), red grouse (Lagopus lagopus scotica), redshank, oystercatcher, curlew and lapwing.		
Tebay Road Cutting SSSI (Geological SSSI) NY610 022, NY607 011	Geological SSSI, citation refers to geological assets only of the Lune Gorge (Silurian sandstone rock exposure with visible strata). No ecological value listed in citation, but Deciduous Woodland, a Habitat of Principal Importance is recorded present.	Connected – immediately adjacent to ARN along A685 at Roundthwaite and M6 ARN, connected via semi-natural habitats.	Within ARN and Within 200m of ARN at Roundthwaite (M6/A685 south of Penrith).
Augill Valley Pasture SSSI NY816146	Species-rich unimproved grassland containing a number of rare and locally restricted plant species and represents one of the most diverse of its kind in East Cumbria. This grassland grades to woodland along the steep banks of Augill Beck, supporting a varied ground flora with ancient woodland indicator species.	Connected and immediately north and south of the ARN between the Appleby to Brough and Bowes Bypass schemes.	Within 200m of the ARN.

Site name, designation, location	Reason for designation	Connectivity[25]	Within 200m of the ARN
God's Bridge SSSI NY957126	This site is designated for its geology: This is the best example in Britain of a natural limestone bridge over an active river course (River Greta) by the process of sub-riverbed cave development on a limited scale. No ecological value listed in citation, but Upland Hay Meadow, a Habitat of Principal Importance is recorded as present within the boundary of this site.	Connected via semi-natural habitats, situated due south of the ARN between the Appleby to Brough and Bowes Bypass schemes (nearest to Bowes).	Within 200m of the ARN.

Non-statutory designated sites

6.2.5.2 There are 27 non-statutory designated sites within 1km of the Project, of which seven sites are also within 200m of the ARN (Table 4: Non-statutory designated sites; ES Figures 6.1: Statutory and Non-statutory Designated Sites (Application Document 3.3)). A further 42 non-statutory designated sites are located within 200m of the ARN and outwith the Project (Table 5: Non-statutory designated sites within 200m of the ARN onlyTable 4: Non-statutory designated sites .

Table 4: Non-statutory designated sites within 1km of the Project

Site name	Reasons for designation	Connectivity	Schemes within 1km[26]
Myers Beck (Mardale Road) CWS NY509297	Myers Beck and associated riparian grassland. Water vole population listed in reasons for designation.	Connected terrestrially via semi-natural habitats along rail line, but otherwise separated via urban habitat at Penrith.	M6 Junction 40 to Kemplay Bank (444m north) Within 200m of the ARN at Penrith

[26] Includes non-statutory designated sites located within 200m of the ARN where the ARN falls within 1km of the Project

Site name	Reasons for designation	Connectivity	Schemes within 1km[26]
		Connected to the ARN with industrial units and rail corridor between	
Eamont Bridge Banks of River Eamont (River Eamont) SIS NY507283 to NY535291	No citation provided. Notified for its invertebrate assemblage of Rivers and Shingles as consistent with the citations for the sites it is within. Associated Sites: This is within River Eden SAC and River Eden and Tributaries SSSI.	Connected – within and adjacent to works areas via semi-natural habitats.	M6 Junction 40 to Kemplay Bank (*within*, south-west) Penrith to Temple Sowerby (396m west)
Skirsgill Woods CWS NY507283	Broadleaved semi-natural woodland with ancient woodland indicator species (but not on the Ancient Woodland Inventory). NVC W9 ash-rowan-dogs mercury woodland. Also for wetland / swamp habitats with NVC M27 meadowsweet mire and S28 reed canary grass communities. Associated sites: Situated north of and connected to River Eden SAC and River Eden and Tributaries SSSI and River Eamont Site of Invertebrate Significance SIS.	Connected – within and adjacent to works areas via semi-natural habitats.	M6 Junction 40 to Kemplay Bank (*within*, south-west)
Yanwath Wood CWS NY512281	Broadleaved woodland NVC W9 Ash-Rowan-Dog's Mercury woodland with Ancient Woodland Indicator species including bluebell (*Hyacinthoides non-scripta*), goldilocks buttercup (*Ranunculus auricomis*) and wood anemone (*Anemone nemorosa*).	Barrier of River Eamont but Order Limits boundary is in close proximity to the opposite bank.	M6 Junction 40 to Kemplay Bank (53m south)
Lowther Bridge SIS NY525280 to NY524283	No citation provided. Notified for its invertebrate assemblage of Rivers and Shingles as consistent with the citations for the sites it is within.	Connected –via River Lowther and adjacent semi-natural habitats.	M6 Junction 40 to Kemplay Bank (393m south)

Site name	Reasons for designation	Connectivity	Schemes within 1km[26]
	Associated Sites: This is within River Eden SAC and River Eden and Tributaries SSSI.		
Watersmeet (Eamont & Eden) CWS NY588306	Riparian habitat at confluence of River Eamont and Eden and the surrounding farmland. Designated for feeding and roosting area for greylag geese (Anser anser) and for presence of whooper swan (Cygnus cygnus), Canada goose (Branta canadensis), goosander (Mergus merganser), goldeneye (Bucephala clangula), pochard (Athya ferina), teal (Anas crecca), widgeon, tufted duck (Athya fuligula) and mallard (Anas platyrhynchos). Barn owl (Tyto alba) are also present.	Connected via farmland and semi-natural habitats to the eastbound verge of the A66.	Penrith to Temple Sowerby (1.0km north)
Whinfell Forest CWS NY 575 274	Large conifer plantation over ancient woodland. With heathland sub-shrubs as ground flora and areas dominated by purple moor-grass habitat. Mosaic of habitats present support plant and animal species and is a dedicated Red Squirrel Refuge. Sixty notable invertebrate species have been recorded present including a Red Data Book (RDB3) species: a snail-killing fly (Ectonocera borealis) and the picture-winged fly (Trypeta immaculata). The site also contains populations of creeping lady's tresses (Goodyera repens).	Connected via semi-natural habitats and farmland to the southbound A66 verge.	Penrith to Temple Sowerby (191m south)
R.Eden, Oglebird Scar Ers SIS NY601269 to NY601271	No citation provided. Notified for its invertebrate assemblage of Rivers and Shingles. Associated Sites: This is within River Eden SAC and River Eden and Tributaries SSSI.	Connected – via River Eden and other semi-natural habitats to the A66 westbound verge.	Temple Sowerby to Appleby (455m west)
Temple Sowerby Shingle Bank SIS NY605276 to NY605277	No citation provided. Notified for its invertebrate assemblage of Rivers and Shingles. Associated Sites: This is within River Eden SAC and River Eden and Tributaries SSSI.	Connected – via River Eden and other semi-natural habitats to the A66 eastbound verge.	Temple Sowerby to Appleby (615m north-west)

Site name	Reasons for designation	Connectivity	Schemes within 1km[26]
Acorn Bank SIS NY612281, NY618281	No citation provided. Notified for its invertebrate assemblage of Rivers and Shingles. Associated Sites: This is within River Eden SAC and River Eden and Tributaries SSSI and within Acorn Bank Woods and Garden LWS.	Connected – via farmland and semi-natural habitats and via River Eden and other semi-natural habitats to the A66 westbound verge.	Temple Sowerby to Appleby (615m north-west)
Acorn Bank Woods and Garden CWS NY615282	Broadleaved ash woodland with formal gardens and pond habitats. Outbuildings support bat roosts for brown long-eared, soprano pipistrelle and natterer's bats and all five native amphibian species present. Associated Sites: Adjacent to River Eden SAC and River Eden and Tributaries SSSI.	Connected – via farmland and semi-natural habitats.	Temple Sowerby to Appleby (957m north)
Bolton Shingle Bank SIS NY648227 to NY651228	No citation provided. Notified for its invertebrate assemblage of Rivers and Shingles. Associated Sites: This is within River Eden SAC and River Eden and Tributaries SSSI.	Connected – via River Eden and other semi-natural habitats and open farmland to the Order Limits.	Temple Sowerby to Appleby scheme (237m south-west)
Chapel Wood (Appleby in Westmoorland) CWS NY666216	Broadleaved ancient woodland (ash, sycamore and hazel). Associated Site: Chapel wood ancient woodland site.	Connected, immediately adjacent to the Order Limits and ARN	Temple Sowerby to Appleby scheme (within, immediately to the south) Within 200m of the ARN
Ross Wood CWS NY674210	Broadleaved semi-natural ancient woodland (oak) with adjoining area of hawthorn scrub to the south, with meadow saxifrage (Saxifraga granulata). The woodland is NVC community W10 Oak-bracken-bramble woodland, with planting of other species within open patches. Numerous ancient woodland	Barrier of the River Eden between this site and the Order Limits.	Temple Sowerby to Appleby scheme (208m south)

Site name	Reasons for designation	Connectivity	Schemes within 1km[26]
	indicator species present including bluebell, wild strawberry (Fragaria vesca), pignut, wood anemone, wood speedwell (Veronica montana) and goldilocks buttercup (Ranunculus auricomus). Associated Site: Ross wood ancient woodland site.		
Dowpits Wood CWS NY677201	Broadleaved ancient well-structured woodland (NVC community W9 ash and oak). Numerous ancient woodland indicator species present, including ramsons, pignut, and ground elder. Reference to the invasive species: Himalayan balsam and giant hogweed (Heracleum mantegazzanium) at the riverside. Associated Site: Dowpits wood ancient woodland site.	Barrier of the River Eden, with farmland habitats between this site and the Order Limits	Temple Sowerby to Appleby scheme (948m south)
Two Special Roadside Verge sites: C2L (8A) and C2L (8B) NY644223	No citation detail provided but known to be roadside verges with species-rich neutral grassland habitat.	Barrier of the River Eden, with farmland habitats between this site and the Order Limits.	Temple Sowerby to Appleby scheme (843m south-west)
Sandford Mire CWS NY727 171	Lowland fens, comprising species-rich mire (NVC community M25c) and rush pasture (NVC community M23) mosaic, with open water in ditches and pond habitat, surrounded by reed beds (NVC community S4) and reed swamp (NVC community S25). The site supports numerous wetland plant species and is noted for the wetland bird species in particular for breeding and overwintering snipe, and other breeding birds, including redshank (Tringa totanus), oystercatcher (Haemotopus ostralegus), curlew (Numenius arquata), lapwing (Vanellus vanellus), reed bunting (Emberiza schoeniclus), meadow pipit (Anthus pratensis) and sedge warblers (Acrocephalus schoenobaenus).	Connected - immediately adjacent to the Order Limits.	Appleby to Brough scheme (7m south)

Site name	Reasons for designation	Connectivity	Schemes within 1km[26]
	Associated sites are River Eden SAC, River Eden and Tributaries SSSI and Ormsby Hall Mire.		
Two Special Roadside Verge sites: C2P (10A) and C2P (10B) NY733167	No citation detail provided but known to be roadside verges with species-rich neutral grassland habitat.	Partial barrier of Eden Valley Railway/ rail bridge, but otherwise connected to the Order Limits and ARN	Appleby to Brough scheme (14m south) and within 200m of the ARN
Two Special Roadside Verge sites: C25 (7A) and C25 (7B) NY734167	No citation detail provided but known to be roadside verges with species-rich neutral grassland habitat.	Partial barrier of Eden Valley Railway/ rail bridge, but otherwise connected to the Order Limits and ARN	Appleby to Brough scheme (15m south) and within 200m of the ARN
Two Special Roadside Verge sites: C25 (6A) and C25 (6B) NY759142	No citation detail provided but known to be roadside verges with species-rich neutral grassland habitat.	Connected - via farmland and semi-natural habitats to the Order Limits.	Appleby to Brough scheme (585m south)
Two Special Roadside Verge sites: C25 (4A) and C25 (4B) NY794132	No citation detail provided but known to be roadside verges with species-rich neutral grassland habitat.	Barrier from Brough residential area and associated infrastructure.	Appleby to Brough scheme (917m south-east) and within 200m of ARN
Swindale Woodland CWS	Broadleaved linear semi-natural woodland (NVC community W9 ash-rowan-dog's mercury, W9 Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis	Connected - via farmland and semi-	Appleby to Brough scheme (515 south)

Site name	Reasons for designation	Connectivity	Schemes within 1km[26]
NY784139	community), with ancient woodland ground flora including ramsons, bluebell, dog's mercury, globeflower (Trollius europaeus), goldilocks buttercup, cowslip and primrose. Grassland habitats nearest to NVC community MG5 crested dog's-tail-common knapweed community (MG5 Cynosurus cristatus-Centaurea nigra community).	natural habitats to the Order Limits.	
Helbeck Wood SIS NY785164	No citation provided, but designated for invertebrate interest, as other overarching designations.	Connected via farmland and semi-natural habitats to the Order Limits.	Appleby to Brough (428m north)
Thorsgill Wood LWS NZ055152	Broadleaved ancient woodland on Thorsgill Beck (ash woodland) with small areas of ancient woodland ground flora and marsh.	Connected to the Order Limits distantly via hedgerow along the B8277 or other semi-natural habitats and farmland.	Cross Lanes to Rokeby (734m north)
Teesbank Woods, Rokeby LWS NZ075145	A varied area of woodland, river, bare rock, islands and shingle banks much of which is an ancient woodland site. Site of rare species - downy currant (Ribes spicatum) and climbing corydalis (Corydalis claviculata).	Connected to the Order Limits distantly via semi-natural habitats and farmland.	Cross Lanes to Rokeby (328m north) Within 200m of the ARN along the B6277 to Barnard Castle
Rokeby Park and Mortham Wood LWS NZ084138	Parkland and wood pasture with limestone gorge woodlands on tops and steep banks of River Greta (and potential Ancient Woodland.	Connected to and immediately adjacent to the Order Limits and ARN	Cross Lanes to Rokeby (*immediately north*) and within 200m of the ARN

Site name	Reasons for designation	Connectivity	Schemes within 1km[26]
Aske Estate Woodlands LWS NZ159055	Connected area of deciduous woodlands including Hartforth Wood, Gilling Wood, Smelt Beck Wood, Lambert Wood all which are semi-naturally ancient woodland with areas of replanted larch and conifers or mixed woodland. Some areas of the woodland are on steep limestone banks. The native woodland includes ash woodland, sessile oak woodland and alder woodland all with a base-rich ground flora and many ancient woodland indicator species. The site is also noted for its population of woodland birds including pied flycatcher (Ficedula hypoleuca).	Connected via semi-natural habitats and farmland to the Order Limits.	Stephen Bank to Carkin Moor (938m south-west)

Table 5: Non-statutory designated sites within 200m of the ARN only

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
Disused Campsite near Houghton CWS NY414588	Aerial shows partially developed	Connected to ARN- Immediately adjacent to road verge.	Within 200m of ARN (adjacent to northbound M6, at Houghton)
Special Roadside Verge C3U (1) - B6264. NY420587	Neutral grassland habitat, some woodland encroachment.	Connected to ARN of M6 and B6264 via semi-natural habitats.	Within 200m of ARN (adjacent to southbound M6 and B6264, at Houghton)

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
Newbiggin Wood CWS NY437511	In part and ancient woodland with semi-natural woodland (sycamore, sessile oak and beech) and mixed woodland on a steep bank above the River Petteril. The wood is mainly acidic but to the south is damper and has more calcium loving species, Throughout is good presence of ancient woodland indicator species. With bat species (noctule).	Connected to ARN- Immediately adjacent to road verge.	Within 200m of M6 ARN (adjacent to southbound M6, due south of Carlisle)
Disused Railway Line near Newbiggin CWS NY483290	Species-rich neutral and calcareous grassland, scrub and tree habitats on banks of railway.	Connected to ARN- Immediately adjacent to road verge.	Within 200m of the A66 (west of M6) ARN
Two Special Roadside Verges: C2D_(2) - Melkinthorpe Rd NY539244 C2D_(3) - Buckholme Wood Rd. NY534242	Roadside verges with species-rich neutral grassland habitat.	Connected to M6 ARN- via semi-natural habitats, some further roadlinks present.	Within 200m of M6 (south of Penrith) ARN (at Melkinthorpe)

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
Special Roadside Verge: C2J_(2) - Sleagill Rd NY567170	Roadside verges with species-rich neutral grassland habitat.	Connected to M6 ARN- via semi-natural habitats to northbound verge of M6.	Within 200m of M6 (south of Penrith) ARN (at Towcett/ Sleagill)
Two Special Roadside Verge sites: C2K_(1A), C2K_(1B) both on road between Shap and Crosby Ravensworth. NY578155	Roadside verges with species-rich neutral grassland habitat.	Connected to M6 ARN- via semi-natural habitats to northbound and southbound verge of M6.	Within 200m of M6 (south of Penrith) ARN (at Shap)
Shap Hay Meadow 2 CWS NY573144	Traditional upland hay meadow, with diverse range of herb species stream and rush mire habitats.	Connected to ARN- Immediately adjacent to road verge.	Within 200m of M6 south ARN (adjacent to southbound M6
Two Special Roadside Verge sites: C2S_(3A),	Roadside verges with species-rich neutral grassland habitat.	Connected to M6 ARN- via semi-natural habitats to northbound	Within 200m of M6 (south of Penrith) ARN (at Tebay)

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
NY60669 C2S_(3B) both on road north of Tebay Services. NY608071		and southbound verge of M6.	
Two Special Roadside Verge sites: C2S_(2A), C2S_(2B) - both on Pikestone Lane. NY607039	Roadside verges with species-rich neutral grassland habitat.	Connected to M6 ARN- via semi-natural habitats to northbound verge of M6.	Within 200m of M6 (south of Penrith) ARN (between Tebay and Borrowdale)
Two Special Roadside Verge sites: C26_(1), NY610025 C2S_(1)	Roadside verges with species-rich neutral grassland habitat.	Connected to M6 ARN- via semi-natural habitats to northbound verge of M6.	Within 200m of M6 (south of Penrith) ARN (at Borrowdale)

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
on road south of Borrowdale. NY610027			
Borrowdale Wood (Low Borrowbridge) CWS NY604013	Ancient semi-natural woodland on north facing slope with small becks and flushes. Alder, ash, rowan and sycamore as canopy with hazel understorey and diverse field layer with ancient woodland indicator species.	Within 200m of the ARN for M6 and A685. Connected via semi-natural habitats and farmland/ heathland/moorland habitats and A685 / River Lune to M6 northbound verge.	Within 200m of the M6 (south of Penrith) ARN and the A685 ARN at Roundthwaite Junction
High Carlingill Wet Holme CWS NY611006	Species-rich marshy grassland and tall herb fen. Areas to the north are dominated by bottle sedge, with a range of other sedge species and marsh pennywort over bog mosses. Further south and east are better examples of the fen vegetation as previous but with a lower rush component. Pond and hedgerow habitats are also present.	Within 200m of the ARN for M6. Minor physical barrier from the Eden / South Lakeland rail corridor, otherwise connected via semi-natural habitats, pasture and heathland/moorland habitats.	Within 200m of the M6 (south of Penrith) ARN. South of Roundthwaite
High Fleetholme Wood CWS SD623976	Ancient semi-natural woodland on a steep east facing slope. The canopy comprises sycamore with oak and ash, with downy birch, bird cherry and alder. The understorey comprises rowan, holly, sycamore, with wych elm, hawthorn, hazel with a diverse ground flora which is rich in herb, fern and bryophyte species.	Within 200m of the ARN for M6 south of Penrith. Minor physical barrier from the Eden / South Lakeland rail corridor, otherwise connected via	Within 200m of the M6 (south of Penrith) ARN.at Lowgill

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
		semi-natural habitats to M6 verge and River Lune.	
Deep Gill CWS SD611969	Steep semi-natural ancient woodland on either side of the gorge of the River Lune. Canopy is ash and sycamore with oak more prevalent in the downstream areas. Sparse ground flora with ancient woodland indicator species.	Within 200m and adjacent to the ARN for M6 northbound verge. Connected via M6 verge (with wooded habitat) to ARN.	Within 200m of the M6 (south of Penrith) ARN
Two Special Roadside Verge sites: 1.2.2_(10A), 1.2.2_(10B) - both on Old Scotch Road at Beck Foot. SD614964	No citation detail provided, but known to be roadside verges with species-rich neutral grassland habitat.	Connected to M6 ARN- via semi-natural habitats to southbound verge of M6.	Within 200m of M6 (south of Penrith) ARN (at Beck Foot)
Firbank Verge CWS SD599934	Neutral grassland with smaller sections of acid grassland and heath with heather, bilberry (Vaccinium myrtillus), heath bedstraw (Galium saxatile) and wavy hair-grass (Deschampsia flexuosa). Same boundary/ designation as 1.2.2_(6A), 1.2.2_(6B) - both on Old Scotch Road at Beck Foot		Within 200m of the M6 (south of Penrith) ARN

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
Two Special Roadside Verge sites: 1.2.2_(6A), SD599936 1.2.2_(6B) - both on Old Scotch Road at Beck Foot. SD599934	Citation provided for Firbank Verge LWS, as above, which shares the same vegetative composition and boundary/ designation as these roadside verges.	Within 200m and adjacent to the ARN for M6 southbound verge. Connected via M6 verge and semi-natural heath/ grassland and beck habitats to ARN.	Within 200m of the M6 (south of Penrith) ARN
Firbank Fell CWS SD612939	Area of acid grassland, upland heath and blanket bog over peat deposits. Areas of drier heath dominated by heather (Calluna vulgaris) with bilberry and moss species and wetter heath dominated by cross leaved-heath (Erica tetralix) with hare's-tail cotton-grass (Eriophorum vaginatum), with purple moor-grass (Molinia caerulea). Blanket bog habitats dominated by sphagnum moss species with areas of acid grassland at flushes and bog bools. The site also supports breeding bird species: curlew (Numenius arquata), snipe (Gallinago gallinago), lapwing (Vanellus vanellus), skylark (Alauda arvensis), wheatear (Oenanthe oenathe) and grouse (species not specified in citation) with merlin (Falco columbarius), short-eared owl (Asio flammeus) and buzzard (Buteo buteo) also present.	Within 200m and adjacent to the ARN for M6 southbound verge. Minor barrier from the Old Scotch Road (Firbank Verge CWS) but otherwise connected via semi-natural heath/ grassland and beck habitats to M6 ARN.	Within 200m of the M6 (south of Penrith) ARN
Killington Reservoir CWS	Large waterbody with surrounding mire and tall herb and fen areas and smaller areas of acid grassland and dry heath.	Within 200m of the ARN for M6 southbound verge. Minor barrier	Within 200m of the M6 (south of Penrith) ARN

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
SD591913	The mire and tall herb fen areas are species-rich with many notable plant species present. The site also supports many breeding bird species and is an important area for passage migrants and for overwintering species.	present for access road to Killington Services and Firbank Road, but otherwise connected via semi-natural habitats of grassland and woodland and pasture.	
Long Moss (Ewebank) CWS SD577900	Wet woodland (Birch species, willow species. and alder) with meadowsweet (Filipendula ulmaria) and tufted hair-grass (Dechampsia cespitosa) and mire habitat to the north of the wood with rushes and bog mosses with notable herb species. Small areas of dry dwarf heath present with stands of gorse evident.	Within 200m of the ARN for M6 northbound verge. Connected via open pasture.	Within 200m of the M6 (south of Penrith) ARN
Bendrigg Mire CWS SD579897	Mosaic of degraded (partially drained, but still with areas of Sphagnum moss species) raised bog which is in transition to purple moor-grass mire. Also present is meadowsweet tall herb mire which is species-rich and with notable plant species present and wet rush pasture, which is generally less species-rich than other areas of the site	Within 200m of the ARN for M6 southbound verge. Connected via open pasture / semi-natural grassland.	Within 200m of the M6 (south of Penrith) ARN
Eskrigg Tarn CWS SD577889	Area of wet woodland of willow species, downy birch (Betula pubescens) and alder (Alnus glutinosa) and marshy grassland with sharp-flowered rush and soft-rush with a range of notable herb species. These habitats surround a small tarn with bottle sedge (Carex rostrata) and common club-rush (Schoenoplectus lacustris). There is also an area of drier mixed woodland with downy birch as the dominant species with sycamore and larch. The site is also noted for its aquatic and terrestrial invertebrate species.	Within 200m of the ARN for M6 southbound verge. Connected via open pasture / semi-natural grassland.	Within 200m of the M6 (south of Penrith) ARN

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
Camsgill Wood CWS SD555835	Ancient semi-natural woodland on a steep sided valley with ravines and crags. Areas are generally of oak or ash dominated woodland, which are affected by basic flushing in the upper section with a rich ground flora and with more neutral soils to lower reaches with fewer field layer components. All comprise typical ancient woodland indicator species for these soil types and influences.	Within 200m of the ARN for M6 southbound verge. Minor physical barrier of minor access road, but otherwise connected via Hellgill Beck and semi-natural woodland to M6 ARN.	Within 200m of the M6 (south of Penrith) ARN
Lancaster Canal CWS (Cumbria) SD539822	Designated for its species-rich freshwater, woodland and grassland habitats and waterfowl. This site has many notable aquatic and marginal species present. Breeding bird species of mallard (Anas platyrhynchos), coot (Fulica atra), moorhen (Gallinula chloropus), and mute swan (Cygnus olor). Fish species of roach (Rutilus rutilus), bream (Abramis brama), tench (Tinca tinca), perch (Perca fluviatilis), pike (Esox lucius), chub (Sualius cephalus) and grass carp (Ctenpharyngon idella). The continuation of this canal habitat is also designated in Lancaster, see Lancaster Canal Whole Length in Lancashire including Glasson Branch Biodiversity Heritage Site (BHS).	Within ARN as passes under M6, north of Milnethorpe Junction 36 M6 / A590. Connected to M6 ARN verges. Also within ARN as passes under M6, south of Milnethorpe Junction 36 M6 / A590. For a distance it remains within 200m of the M6 ARN and at Holme is connected to the ARN along the B6384.	Within 200m of the ARN for the B6384 and the M6 (south of Penrith)
Sexton Hagg Wood CWS SD532780	Parkland and ancient semi-natural woodland on limestone pavement and exposed limestone pavement (Curwen Woods Limestone Pavement Order). Wooded areas are ash, wych elm and sycamore dominated, with some oak and beech standards. The ground flora is species-rich with limestone woodland	Within the 200m of the ARN along the A6070 and along the M6. Connected as	Within 200m of the ARN for the A6070 and f the M6 (south of Penrith)

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
	assemblage which is present both on the surface and crevices (clints and grykes) of the pavement.	immediately adjacent to the A6070.	
Lancaster Canal Biodiversity Heritage Site (BHS) SD527302 to SD521767	Designated for its freshwater, woodland, hedgerow, scrub and grassland habitats. This site supports many notable aquatic and marginal species. Along the length is at least one bat roost and is a foraging resource for bat species, particularly for Daubenton's bat (Myotis daubentonii). Waterfowl species breed here as listed for the Cumbrian section, along with reed bunting (Emberiza schoeniclus) and reed warbler (Acrocephalus scirpaceus). Invertebrate species include many dragonfly and damselfly species. This site is fed by Killington Reservoir LWS and the continuation of this canal habitat is also designated in Cumbria, see Lancaster Canal LWS.	South of Burton in Kendal, Lancaster Canal passes under the M6 ARN and then flanks the southbound verge north of and a little distance south of Tewitfield. Passing under the A6070 ARN at Tewitfield. Also passing under the M6 ARN at Carnforth.	Within M6 and A6070 ARN and within 200m of the M6 (south of Penrith) ARN
Two Special Roadside Verge sites: 1.1.3_(2A), 1.1.3_(2B) - both on Tarn Lane. SD522758	No citation detail provided but known to be roadside verges with species-rich neutral grassland habitat.	Connected to M6 ARN- via semi-natural habitats to southbound verge of M6.	Within 200m of M6 (south of Penrith) ARN (at Burton-in-Kendal)
Dock Acres North BHS at Borwick Lakes SD516731	Open basin supporting grassland, fen, scrub, and exposures, within prior sand and gravel extraction area and drained silt lagoons. These habitats support many notable species, many characteristic of open habitat. The prior silt lagoon areas support open wet grassland with abundant presence of orchid species and area of willow scrub and bulrush swamp.	Minor barrier of dwellings and semi-natural wooded habitat, but otherwise	Within 200m of the M6 and A6070 ARN and within 200m of the M6 (south of Penrith) ARN

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
		connected to the M6 and A6070 ARN.	
Special Roadside Verge: C25 (3) - on A685 road to Brough Sowerby. NY793126	No citation detail provided but known to be roadside verge with species-rich neutral grassland habitat.	Connected to A685 ARN -via semi-natural habitats of site and A685 east verge.	Within 200m of A685 ARN.
Two Special Roadside Verge sites: C2Q (3A), NY776110 C2Q (3B) - both on B6259 Appleby Road to Winton. NY775110	No citation detail provided but known to be roadside verges with broadleaved woodland edge habitat.	Connected to B6259 Appleby Road ARN -via semi-natural habitats of site and B6259 north and south verges.	Within 200m of A685 ARN.
Special Roadside verge:	No citation detail provided but known to be roadside verge with species-rich neutral grassland habitat.	Connected to A66 ARN -via semi-natural habitats of site and the	Within 200m of A66 (outwith the Project) ARN.

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
C2R (3) - on access road from B6276 to A66. NY805148		access road's southernmost verge.	
Special Roadside Verge: C2R (1) - field adjacent to an access road to A66. NY829151	No citation detail provided but known to be roadside verge with species-rich calcareous grassland habitat.	Connected to A66 ARN - via semi-natural habitats and the access road.	Within 200m of A66 (outwith the Project) ARN.
Belah to Stainmore disused line LWS NY843 117	Old rail line with woodland habitat and trees and associated ground flora (wood anemone, lesser celandine, wood sorrel, herb robert, foxglove). North of Barras are also areas of species-rich grassland, supporting species of both calcareous and acid conditions: kidney vetch (Anthyllis vulneraria), small scabious (Scabiosa columbaria), field scabious (Knautia arvensis), harebell (Campanula rotundifolia) and giant bellflower (Campanula latifolia) and open habitats with small toadflax (Chaenorhinum minus).	Connected to A66 ARN, site includes the southbound verges of the A66.	Within 200m of the ARN (south of the A66, outwith but between Appleby to Brough and Bowes Bypass schemes)
Stainmore Common LWS NY859161	Upland site largely comprising blanket bog habitat, dominated by Hare's-tail cotton grass and heather, with wavy hair grass. Wet flushes support peat forming sphagnum mosses or marshy grassland. In thinner peat areas heather, bilberry and crowberry are present and where especially thin and influenced by limestone outcrops reflects a calcareous flora. Areas of steep gills are also present with scrub and woodland flora and also a bog/fen community with bottle	Connected to A66 ARN, site is parallel to north and south peripheries of the A66 verges and slightly overlaps with	Within 200m of the ARN (located north and south of the A66, outwith but between Appleby to Brough

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
	sedge (Carex vesicaria), white sedge (Carex dioica) and lesser spearwort (Ranunculus flammula).	the northbound verge of the A66.	and Bowes Bypass schemes)
Whiley Hill Sandpit LWS NZ274198	Unimproved neutral grassland with scrub and a pond	Connected and immediately adjacent to the A1m northbound verge, between Burtree Gate and Coatham Munderville.	Within 200m of the ARN - A1m (North of Scotch Corner) north of Darlington
Coatham Grange Marsh LWS NZ277159	Marsh habitat with notable plant species including Tubular water dropwort (Oenanthe fistulosa) and great crested newt (Triturus cristatus) also present.	Connected via semi-natural habitats to the A1m southbound verge, between Burtree Gate and Coatham Munderville.	Within 200m of the ARN - A1m (North of Scotch Corner) north of Darlington
Burtree Gate Marsh LWS NZ267190	Area of open water and marsh and species-rich wet grassland habitats. Used as an important resting area for overwintering and passage bird species. Breeding area for jack snipe and shoveler.	Connected and immediately adjacent to the A1m northbound verge, at Burtree Gate.	Within 200m of the ARN - A1m (North of Scotch Corner) north of Darlington
Low Coniscliffe Tees Bank LWS NZ248136	Deciduous woodland, some wet woodland and of importance for breeding lesser spotted woodpecker.	Connected and immediately adjacent to the A1m northbound verge.	Within 200m of the ARN - A1m (North of Scotch Corner) north of Darlington
Pallet Hill LWS SE232981	Old quarry site with areas of open water and open grazed grassland with significant population of non-breeding waterbirds. Also areas of plantation woodland, wet woodland / scrub and hedgerows.	Connected and immediately adjacent to the A6055 ARN, across a further area of verge	Within 200m of the ARN - A6055 and A1(M) (south of

Site name	Reasons for designation	Connectivity	Within 200m of the ARN
		habitat which is the A1m southbound verge.	Scotch Corner), west of Catterick
Great Raygill Dike LWS SE364733	Species-rich fen habitat with standing water with seasonal draw down zones and open vegetation.	Connected - via semi-natural habitats to the A1(M) northbound verge.	Within 200m of the ARN - A1(M) (south of Scotch Corner) at Roecliffe
Brickyard Farm, Roecliffe LWS SE389669	Grassland site with the Schedule 8 plant and possible endemic species: Thistle broomrape (Orobanche reticulata subsp. pallidiflora), a calcicole of often disturbed soils.	Connected - immediately adjacent to the A1(M) southbound verge and within connected semi-natural habitats to the A1(M) northbound verge.	Within 200m of the A1(M) (south of Scotch Corner) ARN, at Roecliffe.

Ancient woodland

6.2.5.3 There are 16 ancient woodlands within 1km of the Project, of which five are also located within the ARN (Table 6: Ancient woodland sites) A further 15 ancient woodlands are located within 200m of the ARN outwith the Project (Table 7: Ancient woodland sites within 200m of the ARN only and ES Figure 5.1: Air Quality Study Area (Application Document 3.3)).

Table 6: Ancient woodland sites within 1km of the Project

Site name	Reason for designation	Connectivity[23]	Schemes within 1km[27]
Skirsgill Wood CWS NY507283	This site supports ancient woodland features and indicator species (not listed on the Ancient Woodland Inventory).	Connected- within Order Limits	Within the M6 Junction 40 to Penrith scheme
Yanwath Wood CWS NY512281	This site supports ancient woodland features and indicator species (not listed on the Ancient Woodland Inventory).	Barrier of River Eamont.	M6 Junction 40 to Penrith scheme
Tipperary and Dudford Woods NY580300	Ancient replanted woodland	Connected via farmland and semi-natural habitats to the Order Limits	Penrith to Temple Sowerby scheme (658m north)
Salter Wood NY578273	Ancient replanted woodland Boundary overlaps with Whinfell Forest CWS.	Connected via farmland and semi-natural habitats to the Order Limits	Penrith to Temple Sowerby scheme (191m south)

[27] Includes ancient woodland located within 200m of the ARN where the ARN falls within 1km of the Project

Site name	Reason for designation	Connectivity[23]	Schemes within 1km[27]
Oglebird Plantation NY601272	Ancient replanted woodland	Connected via farmland and semi-natural habitats to the Order Limits and A66 ARN southbounbd verge	Temple Sowerby to Appleby scheme (451m north-west) Within 200m of the ARN
Chapel Wood NY668216	Ancient semi-natural woodland Boundary overlaps with Chapel Wood (Appleby in Westmoorland) CWS	Connected, immediately adjacent to the Order Limits and ARN	Temple Sowerby to Appleby scheme (immediately south) Within 200m of the ARN
Ross Wood NY673212	Ancient semi-natural woodland and ancient replanted woodland Boundary overlaps with Ross Wood CWS and is immediately adjacent to River Eden SAC and the River Eden and Tributaries SSSI.	Barrier of the River Eden between this site and the Order Limits	Temple Sowerby to Appleby scheme (208m south)
Dowpits Wood NY678201	Ancient replanted woodland Boundary overlaps with Dowpits Wood CWS and is immediately adjacent to River Eden SAC and the River Eden and Tributaries SSSI.	Barrier of the River Eden between this site and the Order Limits	Temple Sowerby to Appleby scheme (941m south-east)
Kiln Hill Wood NY763164	Ancient semi-natural woodland listed on the Ancient Woodland Inventory.	Connected via farmland and semi-natural habitats to the Order Limits	Appleby to Brough scheme (623m north)
Yosgill Wood NY784164 / NY788157	Ancient semi-natural woodland listed on the Ancient Woodland Inventory. Associated sites: Within Hellbeck and Swindale Woods SAC, North Pennine Moors SAC/SPA , Helbeck Wood SIS and partially within and adjacent to Moor House Upper Teesdale SAC and Appleby Fells SSSI.	Connected via farmland and semi-natural habitats to the Order Limits	Appleby to Brough scheme (429m north)

Site name	Reason for designation	Connectivity[23]	Schemes within 1km[27]
Mill Wood (3 of the 12 compartments) NZ062110 and NZ081125 (scheme) NZ039117 (within 200m of ARN)	Ancient semi-natural woodland and ancient replanted woodland Associated sites: Brignall Banks SSSI is within this Ancient Woodland site boundary.	Connected - via seminatural habitats, farmland and parkland to the Order Limits (eastern end of Mill Wood) and the Rutherford Lane ARN (western end of Mill Wood)	Cross Lanes to Rokeby scheme (470m south) Within 200m of the ARN
Thorsgill Wood (ID 1416214) NZ054151	Ancient replanted woodland listed on the Ancient Woodland Inventory Within Thorsgill Wood LWS.	Connected via semi-natural habitats and farmland to the Order Limits and the B6277 ARN	Cross Lanes to Rokeby scheme (735m north) Within 200m of the ARN
Tees Bank Plantation NZ071147	Ancient semi-natural woodland listed on the Ancient Woodland Inventory. Within Teesbank Woods, Rokeby LWS.	Connected via River Tees (barrier for some terrestrial species) and farmland to the Order Limits	Cross Lanes to Rokeby scheme (617m north)
Waterfall Wood (two of the three compartments) NZ079142 and NZ090147	Ancient semi-natural woodland listed on the Ancient Woodland Inventory. Within Teesbank Woods, Rokeby LWS.	Connected via River Tees (barrier for some terrestrial species) and farmland to the Order Limits.	Cross Lanes to Rokeby scheme (495m north)
Graham's Gill/ Jack Wood (ID 1416213)	Ancient replanted woodland listed on the Ancient Woodland Inventory.	Connected - immediately adjacent to	Cross Lanes to Rokeby scheme (Within Order Limits))

Site name	Reason for designation	Connectivity[23]	Schemes within 1km[27]
NZ073132		the Order Limits and A66 ARN	Within 200m of the ARN
Hartforth Wood (one of the two compartments) NZ161061	Ancient replanted woodland listed on the Ancient Woodland Inventory.	Distantly connected via farmland and semi-natural habitats to the Order Limits.	Stephen Bank to Carking Moor scheme (937m south-east)

Table 7: Ancient woodland sites within 200m of the ARN only

Site name	Reason for designation	Connectivity[23]	Schemes within 1km
Newbiggin Wood NY438510	Ancient and Semi-Natural woodland	Connected to M6 ARN via semi-natural habitats and River Petteril to the M6 southbound verge.	Within 200m of the M6 (north of Penrith) ARN
Lowhurst Wood NY429501	Ancient Replanted Woodland / Plantation over Ancient Woodland	Connected to M6 ARN via semi-natural habitats to the M6 northbound verge.	Within 200m of the M6 (north of Penrith) ARN
Gill Beck Wood NY435480	Ancient and Semi-Natural woodland	Connected to M6 ARN via semi-natural habitats to the M6 southbound verge.	Within 200m of the M6 (north of Penrith) ARN

Site name	Reason for designation	Connectivity[23]	Schemes within 1km
Raughtonguill Wood (one of the two compartments) NY440460	Ancient and Semi-Natural woodland	Connected to M6 ARN via semi-natural habitats to the M6 southbound verge.	Within 200m of the M6 (north of Penrith) ARN
Bessygill Wood NY549216	Ancient Replanted Woodland / Plantation over Ancient Woodland	Connected to M6 ARN via semi-natural habitats to the M6 verge.	Within 200m of the M6 (south of Penrith) ARN
Borrowdale Wood NY604013	Ancient and Semi-Natural woodland Within Borrowdale Wood (Low Borrowbridge LWS)	Connected to M6 ARN via semi-natural habitats to the M6 northbound verge.	Within 200m of the M6 (South of Penrith ARN)
Lowgill Wood SD623976	Ancient and Semi-Natural woodland Within High Fleetholme LWS	Partial barrier of rail corridor between this wood and the M6 southbound verge. To the east the site is bound by the River Lune.	Within 200m of the M6 (South of Penrith) ARN
Deep Gill SD611969	Ancient and Semi-Natural woodland Within Deep Gill LWS	Connected to the M6 northbound verge via verge planting.	Within 200m of the M6 (South of Penrith) ARN

Site name	Reason for designation	Connectivity[23]	Schemes within 1km
Cocklet Wood SD556857	Ancient Replanted woodland / Plantation over ancient woodland	Connected to M6 ARN via semi-natural habitats to the M6 southbound verge.	Within 200m of the M6 (south of Penrith) ARN
Warth Wood SD553845	Ancient and Semi-Natural woodland	Connected to M6 ARN via semi-natural habitats to the M6 southbound verge.	Within 200m of the M6 (south of Penrith) ARN
Sexton Hagg Wood SD532779	Ancient and Semi-Natural woodland Within Sexton Hagg LWS	Connected to M6 ARN via semi-natural habitats to the M6 verge.	Within 200m of the M6 (south of Penrith) ARN
Sexton Hagg Extension SD530782	Ancient and Semi-Natural woodland Within Sexton Hagg LWS	Connected to M6 ARN via semi-natural habitats to the M6 verge.	Within 200m of the M6 (south of Penrith) ARN
Limekiln Wood (one of two compartments) SE237966	Ancient and Semi-Natural woodland Situated to either side of Catterick Lane. Within denotified SINC site Limekiln Wood LWS.	Eastern component is connected to the A66 ARN via semi-natural habitats, the western component has a barrier of Catterick Lane.	Within 200m of the Catterick Lane ARN and A1(M) (south of Scotch Corner) ARN, due south of Catterick.

Site name	Reason for designation	Connectivity[23]	Schemes within 1km
Augill Beck Wood NY808144	Ancient and Semi-Natural woodland	Connected to A66 ARN via semi-natural habitats.	Within 200m of the A66 (east of Brough) ARN
Augill Bridge Wood NY817174	Ancient and Semi-Natural woodland Associated site: Part of Augill Valley Pasture SSSI.	Connected to A66 ARN via semi-natural habitats.	Within 200m of the A66 (east of Brough) ARN

Veteran, ancient and notable trees

6.2.5.4 From desk based sources there are 69 known veteran, ancient and notable trees within 1km of the Project (10 ancient, 38 veteran and 21 notable). All are located outside the Order Limits, although two are within less than 1m and are therefore immediately adjacent (a veteran oak within the Temple Sowerby to Appleby Scheme and one notable sycamore in the Cross Lanes to Rokeby scheme)Five (1 ancient and 4 veteran) of the above 69 trees are also located within 200m of the ARN. (ES Figure 6.2: Ancient Woodland, Ancient Tree Inventory and Priority Habitats (Application Document 3.3).

6.2.5.5 From the field data available, a further three trees (one confirmed ancient oak, namely the Sleastonhow oak, dating from around 1600) and two veteran or ancient ash trees were identified within the Temple Sowerby to Appleby scheme. These three trees are within the Order Limits and are within 200m of the ARN.

Affected Road Network (ARN)

Statutory designated sites

6.2.5.6 Within 200m of the ARN there are ten statutory designated sites namely:

- River Eden SAC (also within the Order Limits)
- River Eden and Tributaries SSSI (also within the Order Limits)
- North Pennine Moors SAC (also within 2km of the Project)
- North Pennine Moors SPA (also within 2km of the Project)
- Bowes Moor SSSI (also within 2km of the Project)
- Asby Complex SAC
- Crosby Ravensworth Fell SSSI
- Tebay Road Cutting SSSI (geological SSSI)
- Augill Valley Pasture SSSI
- God's Bridge SSSI (geological SSSI)

Non-statutory designated sites

6.2.5.7 Within 200m of the ARN there are 49 non-statutory designated sites namely:

- Myers Beck CWS (also within 1km of the Project)
- Chapel Wood (Appleby in Westmoorland) CWS (also within Order Limits)
- Two Special Roadside Verge sites C2P (10A) and C2P (10B) (also within 1km of the Project)
- Two Special Roadside Verge sites C25 (7A) and C2P (7B) (also within 1km of the Project)
- Teesbank Woods, Rokeby LWS (also within 1km of the Project)
- Rokeby Park and Mortham Wood LWS (also within Order Limits)
- Disused Campsite near Houghton CWS
- Special Roadside Verge C3U (1) - B6264 road
- Newbiggin Wood CWS
- Disused Railway Line near Newbiggin CWS

- Two Special Roadside Verge sites: C2D_(2) - Melkinthorpe Rd; C2D_(3) - Buckholme Wood Rd
- Special Roadside Verge site: C2J_(2) - Sleagill Rd
- Two Special Roadside Verge sites: C2K_(A), C2K_(B) both on road between Shap and Crosby Ravensworth
- Shap Hay Meadow 2 LWS
- Two Special Roadside Verge sites: C2S_(3A), C2S_(3B) both on road north of Tebay Services
- Two Special Roadside Verge sites: C2S_(2A), C2S_(2B) - both on Pikestone Lane
- Two Special Roadside Verge sites: C26_(1), C2S_(1) on road south of Borrowdale
- Borrowdale Wood (Low Borrowbridge) CWS
- High Carlingill Wet Holme CWS
- High Fleetholme Wood CWS
- Deep Gill CWS
- Two Special Roadside Verge sites: 1.2.2_(10A), 1.2.2_(10B) - both on Old Scotch Road at Beck Foot.
- Firbank Verge LWS
- Two Special Roadside Verge sites (1.2.2_(6A), 1.2.2_(6B) - both on Old Scotch Road at Beck Foot
- Firbank Fell CWS
- Killington Reservoir CWS
- Long Moss (Ewebank) CWS
- Bendrigg Mire CWS
- Eskrigg Tarn CWS
- Camsgill Wood CWS
- Lancaster Canal CWS (Cumbria)
- Sexton Hagg Wood CWS
- Lancaster Canal Biodiversity Heritage Site (BHS)
- Two Special Roadside Verge sites: 1.1.3_(2A), 1.1.3_(2B) - both on Tarn Lane
- Dock Acres North BHS at Borwick Lakes
- Two Special Roadside Verge sites: C25 (4A), C25 (4B) - both on A685 road
- Special Roadside Verge: C25 (3) - on A685 road
- Two Special Roadside Verge sites: C2Q (3A), C2Q (3B) - both on B6259 Appleby Road
- Special Roadside Verge: C2R (3) - on access road from B6276 to A66.
- Special Roadside Verge: C2R (1) - field adjacent to access road to A66
- Belah to Stainmore disused line LWS
- Stainmore Common LWS
- Whiley Hill Sandpit LWS
- Coatham Grange Marsh LWS
- Burtree Gate Marsh LWS

- Low Coniscliffe Tees Bank LWS
- Pallet Hill LWS
- Great Raygill Dike LWS
- Brickyard Farm, Roecliffe LWS.

Ancient woodland

6.2.5.8 Within 200m of the ARN there are 20 ancient woodland sites namely:

- Graham's Gill/ Jack Wood Ancient Replanted woodland (also within order limits)
- Oglebird Plantation Ancient Replanted woodland (also within 1km of the Project)
- Chapel Wood Ancient and Semi-Natural woodland (also within 1km of the Project)
- Mill Wood Ancient and Semi-Natural woodland (also within 1km of the Project)
- Thorsgill Wood Ancient Replanted woodland (also within 1km of the Project)
- Newbiggin Wood Ancient and Semi-Natural woodland
- Lowhurst Wood Ancient Replanted woodland / Plantation over Ancient woodland
- Gill Beck Wood Ancient and Semi-Natural woodland
- Raughtonguill Wood Ancient and Semi-Natural woodland
- Bessygill Wood Ancient Replanted woodland / Plantation over Ancient woodland
- Borrowdale Wood Ancient and Semi-Natural woodland
- Lowgill Wood Ancient and Semi-Natural woodland
- Deep Gill Ancient and Semi-Natural woodland
- Cocklet Wood Ancient Replanted Woodland / Plantation over Ancient woodland
- Warth Wood Ancient and Semi-Natural woodland
- Sexton Hagg Wood Ancient and Semi-Natural woodland
- Sexton Hagg Extension Ancient and Semi-Natural woodland
- Limekiln Wood Ancient and Semi-Natural woodland
- Augill Beck Wood Ancient and Semi-Natural woodland
- Augill Bridge Wood Ancient and Semi-Natural woodland

Ancient, veteran and notable trees

6.2.5.9 Within 200m of the ARN there are 29 identified ancient or veteran trees (Figure 5.1: Air Quality Study Area (Application Document 3.3)).

M6 Junction 40 to Kemplay Bank

Statutory designated sites

6.2.5.10 Within 2km of this scheme there are three statutory designated sites namely:

- River Eden SAC (within the Order Limits and within 200m of the ARN)

- River Eden and Tributaries SSSI (within the Order Limits and within 200m of the ARN)
- Cowraik Quarry SSSI and LNR.

Non-statutory designated sites

6.2.5.11 Within 1km there are five non-statutory designated sites namely:

- Myers Beck CWS (within 200m of the ARN)
- Eamont Bridge, Banks of R. Eamont SIS (Site of Invertebrate Significance) (within the Order Limits)
- Lowther Bridge SIS
- Skirsgill Woods CWS (including potential presence of ancient woodland habitat) (within the Order Limits)
- Yanwath Wood CWS (including potential presence of ancient woodland habitat).

Ancient woodland

6.2.5.12 No areas of ancient woodland listed on the Ancient Tree Inventory are located within 1km of this scheme; however Skirsgill Wood CWS and Yanwath Wood CWS have been identified as having the potential presence of ancient woodland habitat.

Ancient, veteran and notable trees

6.2.5.13 Within 1 km of this scheme but outside the Order Limits are six veteran trees (silver birch, common beech, field maple, holly and two common lime), and four notable trees (common yew, two sycamore and common lime).

Penrith to Temple Sowerby

Statutory designated sites

6.2.5.14 Within 2km of this scheme are five statutory designated sites namely:

- River Eden SAC (within the Order Limits and within 200m of the ARN)
- River Eden and Tributaries SSSI (within the Order Limits and within 200m of the ARN)
- Udford Low Moss SSSI
- Cowraik Quarry SSSI and LNR.

Non-statutory designated sites

6.2.5.15 Within 1km of this scheme are three non-statutory designated sites namely:

- Eamont Bridge, Banks of River Eamont SIS
- Whinfell Forest CWS
- Watersmeet CWS.

Ancient woodland

6.2.5.16 Within 1km of this scheme are two ancient woodland sites namely:

- Tipperary and Dudford Woods

- Salter Wood.

Ancient, veteran and notable trees

6.2.5.17 Within 1 km of this scheme but outside the Order Limits are two veteran (ash) trees and three notable trees (two pedunculate oak and one common lime).

Temple Sowerby to Appleby

Statutory designated sites

6.2.5.18 Within 2km of this scheme are three statutory designated sites namely:

- River Eden SAC (within the Order Limits)
- River Eden and Tributaries SSSI (within the Order Limits)
- Temple Sowerby Moss SSSI.

Non-statutory designated sites

6.2.5.19 Within 1km of this scheme are nine non-statutory designated sites namely:

- Chapel Wood (Appleby in Westmoorland) CWS (within Order Limits and within 200m of the ARN)
- Ross Wood CWS
- Dowpits Wood CWS
- Acorn Bank SIS
- Bolton Shingle Bank SIS
- R.Eden, Oglebird Scar Ers SIS
- Temple Sowerby Shingle Bank SIS
- Acorn Bank Woods and Garden CWS
- Roadside Verges C2L (8a and 8b).

Ancient woodland

6.2.5.20 Within 1km of this scheme are four ancient woodland sites namely:

- Chapel Wood (immediately south of Order Limits)
- Oglebird Plantation (within 200m of the ARN)
- Ross Wood
- Dowpits Wood.

Notable, ancient and veteran trees

6.2.5.21 Within 1km of this scheme but outside the Order Limits are four veteran trees (an oak, a pedunculate oak, a sessile oak and a common lime tree from desk data), four notable trees (one pedunculate oak and three horse chestnut trees from desk data) and three potential veteran or ancient trees (one pedunculate oak, and two ash trees from field data).

Appleby to Brough

Statutory designated sites

6.2.5.22 Within 2km of this scheme are nine statutory designated sites namely:

- River Eden SAC (within 200m of the ARN)
- Moor House Upper Teesdale SAC
- Helbeck and Swindale Woods SAC
- North Pennine Moors SPA (within 200m of the ARN)
- River Eden and Tributaries SSSI
- Helbeck Wood SSSI
- Swindale Wood SSSI
- Appleby Fells SSSI
- George Gill SSSI.

Non-statutory designated sites

6.2.5.23 Within 1km of this scheme are 7 non-statutory designated sites namely:

- Sandford Mire CWS
- Helbeck Wood SIS
- Swindale Woodland LWS
- Roadside verges C2P (10A) and C2P (10B) (within 200m of the ARN)
- Roadside verges C25 (7A) and C25 (7B) (within 200m of the ARN)
- Roadside verges C25 (4A) and C25 (4B) (within 200m of the ARN)
- Roadside verges C25 (6A) and C25 (6B).

Ancient woodland

6.2.5.24 Within 1 km of this scheme are two ancient woodland sites namely:

- Kiln Hill Wood
- Yosgill Wood.

Notable, ancient and veteran trees

6.2.5.25 Within 1km of this scheme but outside the Order Limits there is one ancient tree (beech) and two veteran trees (beech and ash) (desk data).

Bowes Bypass

Statutory designated sites

6.2.5.26 Within 2km of this scheme are four statutory designated sites namely:

- North Pennine Moors SAC (within 200m of the ARN)
- North Pennine Moors SPA (within 200m of the ARN)
- Bowes Moor SSSI (within 200m of the ARN)
- Kilmond Scar SSSI.

Non-statutory designated sites

6.2.5.27 Within 1km of this scheme are no non-statutory designated sites.

Ancient woodland

6.2.5.28 Within 1km of this scheme are no ancient woodland sites.

Notable, ancient and veteran trees

6.2.5.29 Within 1km of this scheme but outside the Order Limits is one veteran tree (crab apple) (desk data).

Cross Lanes to Rokeby

Statutory designated sites

6.2.5.30 Within 2km of this scheme are two statutory designated sites namely:

- Brignall Banks SSSI
- Kilmond Scar SSSI.

Non-statutory designated sites

6.2.5.31 Within 1km of this scheme are three non-statutory designated sites namely:

- Rokeby Park and Mortham Wood LWS (immediately north of Order Limits and wihtin 200m of the ARN)
- Teesbank Woods, Rokeby LWS
- Thorsgill Wood LWS.

Ancient woodland

6.2.5.32 Within 1 km of this scheme are five ancient woodland sites namely:

- Graham's Gill/Jack Wood (ID 1416213) (within Order Limit)
- Mill Wood
- Tees Bank Plantation
- Thorsgill Wood
- Waterfall Wood.

Notable, ancient and veteran trees

6.2.5.33 Within 1km of this scheme but outside the Order Limits are eight ancient trees (an oak species, sessile oak, two pedunculate oak, ash, wild cherry, small-leaved lime and a false acacia), 22 veteran trees ((two ash, beech, crab apple, a cherry species, two wild cherry, holly, three horse chestnut, a lime species, large-leaved lime three sycamore, two examples of an oak species, pedunculate oak, two sessile oak and yew) and 11 notable trees (beech, horse chestnut, eight sycamore and wild cherry).

Stephen Bank to Carkin Moor

Statutory designated sites

6.2.5.34 Within 2km of this scheme are no statutory designated sites.

Non-statutory designated sites

6.2.5.35 Within 1km of this scheme is one non-statutory designated site namely:

- Aske Estate Woodlands LWS

Ancient woodland

6.2.5.36 Within 1km of this scheme is one ancient woodland site namely:

- Hartforth Wood

Notable, ancient and veteran trees

6.2.5.37 Within 1km of this scheme but outside the Order Limits is one ancient ash tree (desk data).

A1(M) Junction 53 Scotch Corner

Statutory designated sites

6.2.5.38 Within 2km of this scheme is one statutory designated sites namely:

- Black Scar Quarry SSSI

Non-statutory designated sites

6.2.5.39 Within 1km of this scheme are no non-statutory designated sites.

Ancient woodland

6.2.5.40 Within 1km of this scheme are no ancient woodland sites.

Notable, ancient and veteran trees

6.2.5.41 Within 1km of this scheme but outside the Order Limits is one veteran oak tree (desk data).

Future baseline

6.2.5.42 The ecological baseline conditions described above represent those which exist in the absence of the Project and at the time of the desk study review. As stated in Section 3 of CIEEM's *Guidelines for Ecological Impact Assessment in the UK and Ireland* potential changes in baseline conditions also need to be identified in order to assess impacts.

6.2.5.43 Based on the desk data collected and land use at the time of survey, the future baseline in the absence of the Project is unlikely to change significantly. Subtle changes are expected due to climate change, such as habitat succession and colonisation, 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.