

**A66 Northern Trans-Pennine Project  
TR010062**

**3.4 Environmental Statement  
Appendix 6.4 Hedgerow**

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

**Planning Act 2008**

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

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**The Infrastructure Planning  
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A66 Northern Trans-Pennine Project  
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**3.4 ENVIRONMENTAL STATEMENT  
APPENDIX 6.4 HEDGEROW**

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## CONTENTS

<b>1</b>	<b>Hedgerows .....</b>	<b>1</b>
1.1	Introduction .....	1
1.2	Legislation and Policy Framework.....	1
1.3	Methodology .....	5
1.4	Assumptions and limitations.....	8
1.5	Results.....	9
1.6	Discussion .....	24
1.7	References .....	25

# 1 Hedgerows

## 1.1 Introduction

### Project background

- 1.1.1 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.
- 1.1.2 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.
- 1.1.3 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, refer to Chapter 2: The Project (Application Document 3.2).

### Scope of the document

- 1.1.4 This report presents desk study data and baseline survey results for hedgerows. Baseline surveys were conducted during 2021 and January 2022. 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 hedgerows 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.

## 1.2 Legislation and Policy Framework

### Legislation

#### *The Hedgerow Regulations 1997*

- 1.2.1 The Hedgerow Regulations 1997 control the removal of ‘important’ hedgerows through a system of notification. These Regulations set out criteria for determining whether a hedgerow should be considered ‘important’.
- 1.2.2 These Regulations do not apply once planning permission has been granted, but the Hedgerow Regulations criteria can be used to assess hedgerows to give an indication of their ecological value.
- 1.2.3 To be classified as ‘important’ under the wildlife and landscape criteria, a hedgerow must fulfil one of the criteria in Schedule 1 of the Hedgerow Regulations. The hedge must be over 30 years old and satisfy one of the following:
- contains certain categories of species of birds, animals or plants listed in the Wildlife and Countryside Act 1981<sup>1</sup> or classified as “endangered”,

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<sup>1</sup> UK Government (1981) The Wildlife and Countryside Act, 1981, HMSO London. [Accessed March 2022]

- “extinct”, “rare” or “vulnerable” in Britain within a Red Data Book Joint Nature Conservation Committee (JNCC) publications<sup>2</sup>
- include six or more woody species listed in Schedule 3 of the Hedgerow Regulations in the surveyed section
  - include five woody species in the surveyed section and at least three features listed in of the Hedgerows Regulations
  - include five<sup>Error! Bookmark not defined.</sup> woody species including one of the following rare native trees – native black poplar, large leaved lime, small leaved lime and wild service tree
  - include at least four<sup>Error! Bookmark not defined.</sup> woody species in the surveyed section and have four or more of the features listed in paragraph 4 of the Hedgerow Regulations
  - have four woody species in the surveyed section, is adjacent to a footpath, bridleway or byway open to all traffic and have two or more features listed in paragraph 4 of the Hedgerow Regulations
- 1.2.4 The Hedgerow Regulations do not apply to any hedgerow within the curtilage of, or marking a boundary of the curtilage of, a dwelling-house.

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

- 1.2.5 The UK Biodiversity Action Plan (UKBAP) covering 2011-2020 has been superseded by the *UK Post-2010 Biodiversity Framework* (JNCC, 2012)<sup>3</sup>. The framework identifies 65 Priority Habitats and 1150 Priority Species that are in need of protection. This list has been used to define habitats and species of ‘Principal Importance’ in England (the Section 41 list) as required by the Natural Environment and Rural Communities (NERC) Act 2006.
- 1.2.6 All hedgerows which support one native woody species (regardless of importance under the Hedgerow Regulations (1997) are habitats of principal importance under Section 41 of the NERC Act. The NERC Act requires public authorities to have regard to the purpose of conserving biodiversity in relation to these species and habitats.

#### *National level policy*

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

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

*“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*

<sup>2</sup> JNCC (2022) JNCC Conservation Designations for UK taxa – collation updates. [Accessed March 2022]

<sup>3</sup> Joint Nature Conservation Committee (2012) UK Post-2010 Biodiversity Framework (2012-2019),.

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

*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)*

1.2.8 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)*

1.2.9 Table 1: NPSNN of relevance to hedgerows identifies the NPSNN policies relevant to hedgerows.

Table 1: NPSNN of relevance to hedgerows

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

Relevant 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 Marine Management Organisation (MMO), and whether Natural England and/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*

1.2.10 The *National planning policy framework (NPPF)* (Ministry of Housing, Communities & Local Government, 2021)<sup>5</sup> originally published in March 2012 and most recently updated in July 2021, sets out the government’s planning policies for England and provides a framework within which locally prepared plans can be produced. The *NPPF* is “*an important and relevant matter to be considered in decision making for NSIP*”<sup>6</sup>.

### *Regional and local level policy*

- 1.2.11 Although the *UK Biodiversity Action Plan (BAP)* has been superseded, BAPs are still widely used at county level to support Biodiversity 2020 (Department for Environment, Food and Rural Affairs, 2011)<sup>7</sup>.
- 1.2.12 Ancient and species rich hedgerows are listed as a priority habitat within the Cumbria BAP (Cumbria Biodiversity Partnership, 2001)<sup>8</sup> and Richmondshire District Councils BAP (Richmond County Council, 2014)<sup>9</sup>.
- 1.2.13 Native hedgerows are a priority habitat on the Durham County Council BAP (2012/13) now listed on North East England Nature Partnership website (North East England Nature Partnership, 2013)<sup>10</sup>.
- 1.2.14 The following local planning policies and documents are relevant to this report:
- *Eden Local Plan (2014-2032)* (Eden District Council, 2014)<sup>11</sup> Policy ENV1 and Policy ENV4
  - *County Durham Plan (Adopted 2020)* (Durham County Council, 2020)<sup>12</sup> Policy 26, Policy 40, Policy 41, Policy 42 and Policy 43
  - *Richmondshire Local Plan (2012-2028)* adopted 2014 (Richmondshire District Council, 2014)<sup>13</sup> Core Policy CP12

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

<sup>6</sup> Nationally Significant Infrastructure Projects (NSIP).

<sup>7</sup> Department for Environment, Food and Rural Affairs (2011) Biodiversity 2020: A Strategy for England’s Wildlife and Ecosystem Services.

Department for Environment, Food and Rural Affairs, London.

<sup>8</sup> Cumbria Biodiversity Partnership (2001) The Cumbria Biodiversity Action Plan.

<sup>9</sup> Richmond County Council (2014) Richmondshire Biodiversity Action Plan.

<sup>10</sup> North East England Nature Partnership (2013) Biodiversity Priorities

<sup>11</sup> Eden District Council (2014) Eden Local Plan 2014 to 2032.

<sup>12</sup> Durham Council (2020) County Durham Plan – Adopted 2020.

<sup>13</sup> Richmond County Council (2014) Richmondshire Local Plan 2012 - 2028 Core Strategy (Adopted 9 December 2014)



## Other relevant policy and guidance

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

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

## 1.3 Methodology

### Desk study

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

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

1.3.2 The study area was defined as follows with measurements taken from the nearest point from the Order Limits:

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

1.3.3 This information was used to provide context and data on hedgerows recorded within the study area.

### Field survey

1.3.4 All hedgerows identified within the Phase 1 Habitat Survey data (Environmental Statement (ES) Appendix 6.3: Phase 1 Habitat Survey (Application Document 3.4)) located within the Order Limits were selected for survey.

1.3.5 In addition, those hedgerows also falling within, or partly within, a 50m buffer from the Order Limits were selected for survey. Where hedgerows

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<sup>14</sup> Chartered Institute of Ecology and Environmental Management (2018) *Guidance for Ecological Impact Assessment in the United Kingdom Third Edition*.

<sup>15</sup> Highways England (2020) *Design Manual for Roads and Bridges LD 108 Biodiversity Design*, Revision 1, March 2020.

<sup>16</sup> Highways England (2020) *Design Manual for Roads and Bridges LD 118 Biodiversity Design*, Revision 1, March 2020



extend beyond the 50m buffer, the entirety of that hedgerow was surveyed, where land access had been agreed.

- 1.3.6 Hedgerows were excluded from survey where situated greater than 50m from the Order Limits.. However, the locations of these and all hedgerows within 250m were captured by Phase 1 habitat surveys.
- 1.3.7 Each hedgerow identified for survey was recorded and mapped with a unique Hedge Site Survey ID. The locations of the hedgerows identified for survey and not subject to survey are shown on the accompanying ES Figure 6.4: Hedgerow and NVC Survey Location mapping (Application Document 3.3).
- 1.3.8 The following categories were assigned to all hedgerows within the study area:
- hedgerows surveyed and identified as 'important' due to meeting biodiversity criteria within the Hedgerow Regulations (1997)
  - hedgerows surveyed and identified as 'not- important' due to not meeting the biodiversity criteria within the Hedgerow Regulations (1997)
  - hedgerows that were surveyed that meet the hedgerow HoPI criteria and are stated as S41 hedges (Section 41 of the NERC Act 2006)
  - hedgerows that were not surveyed that either have, or have the potential to meet the hedgerow HoPI criteria
- 1.3.9 Any hedgerows that supported non-native woody species are not presented within the mapping (ES Figure 6.4 Hedgerow and NVC Survey Locations mapping (Application Document 3.3)).
- 1.3.10 During the field surveys data was collected using the various habitat classification systems. These include: JNCC Phase 1 habitat surveying; Defra Hedgerow surveying; UK Habitat surveying; and classification of habitats based on Defra Metric 2.0.

#### *Hedgerow Survey*

- 1.3.11 The hedgerow surveys undertaken followed the methodology within the Defra *Hedgerow Survey Handbook* (Department for Environment, Food and Rural Affairs, 2007)<sup>17</sup> and recorded important details about the hedgerow, including:
- hedge location
  - start and end points of each hedgerow were recorded using a 10 figure British National Grid Reference from a suitable phone app or GPS device
  - approximate hedge measurements (length, width and height)
  - condition and growth form
  - component woody and non-woody species for the entire hedge and their abundance using the dominant, abundant, frequent, occasional, rare (DAFOR) criteria
  - number of mature trees
  - presence of protected or otherwise notable species (including invasive species)

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<sup>17</sup> Department for Environment, Food and Rural Affairs (2011) Hedgerow Survey Handbook.

- total number of other hedgerow connections to the hedgerow being surveyed was also recorded
- presence of hedge features including walls, ditches, banks, parallel hedges and any adjacent bridleways or byways
- total number of 30m section surveys undertaken (up to three) and for each of these component woody and non-woody species, as a total and average value

1.3.12 The survey also included details to ascertain whether the hedgerow surveyed qualified as 'Important' by complying with the requirements of the 'Wildlife and Landscape Criteria' as defined within The Hedgerow Regulations (1997).

1.3.13 This assessment only deals with the biodiversity elements of Important Hedgerow criteria, not the heritage elements.

#### *Phase 1 Habitat Surveying*

1.3.14 The JNCC Phase 1 habitat survey methodology identifies linear features in the landscape such as stone walls, hedgerows, fence lines and ditches. Hedgerows are sub-divided into the following habitat classifications:

- J2.1.1 Intact hedge – native species-rich;
- J2.1.2 Intact hedge – species-poor;
- J2.2.1 Defunct hedge – native species-rich;
- J2.2.2 Defunct hedge – species poor;
- J2.3.1 Hedge with trees- native species-rich; and
- J2.3.3 Hedge with trees – species-poor.

#### *UK Habitat Classification System*

1.3.15 The following UK Habitat Survey classifications were recorded routewide:

- h2 Hedgerows
- h2a Hedgerows (priority habitat)
- h2b Other hedgerows
- w1g6 Line of trees.

#### *Defra Metric 2.0*

1.3.16 In addition, the *UK Habitat Classification* Habitat Classification - Habitat Definitions V1.1 (Butcher et al. 2020)<sup>18</sup> was also used to assign a habitat code and UK Habitat condition scoring was also recorded using *Biodiversity metric 2.0: Auditing and accounting for biodiversity value - User Guide* (Panks et al. 2019)<sup>19</sup>.

1.3.17 The habitat classifications used in the Metric provide additional information on hedgerows and lines of trees. These are described as associated features within the results section.

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<sup>18</sup> Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020) *UK Habitat Classification - Habitat Definitions V1.1*.

<sup>19</sup> Panks, S., White, N., Newsome, A., Potter, J., Heydon, M., Mayhew, E., Alvarez, M., Russell, T., Scott, S.J., Heaver, M., Scott, S.H., Treweek, J., Butcher, B. and Stone, D. (2019) *Biodiversity metric 3.0: Auditing and accounting for biodiversity value - User Guide*. Natural England.

1.3.18 The following associated UK Habitat condition scoring were recorded routewide:

- Good
- Moderate
- poor

## 1.4 Assumptions and limitations

1.4.1 The data presented in this report is an amalgamation of hedgerow data collected in the aforementioned Phase 1 surveying and Hedgerow surveying that was undertaken between October 2021 and January 2022. Due to technical IT issues some data is still being processed; therefore, both the Phase 1 hedgerow dataset and Hedgerow dataset have been combined and assumptions have been made on a number of hedgerows to provide one draft dataset to enable analysis of results to be undertaken. As a proportion, 33% of Important Hedgerows, and 38% of S41 Hedgerows have been assumed. Further work is required during the detailed design stage of the Project to finalise the dataset by verifying these assumptions.

1.4.2 Professional judgement was used during the assumptions assessment of the 33% of Important Hedgerows and 38% of S41 Hedgerows. Firstly, any non-native hedgerows for example those of Cypress species (*Cupressocyparis x leylandii*) were excluded from the Important and S41 Hedgerow status assessment. Of those native hedgerows remaining, an assessment of the condition was undertaken using available information (Phase 1 habitat survey notes, photographs). Where unlikely to be 'important', for example those only containing one species such as beech (*Fagus sylvatica*) or hawthorn (*Crataegus monogyna*), or hedgerows with no obvious features such as trees or ditches, were identified as 'assumed hedgerow HoPI'. Those where this detail was lacking, incomplete or ambiguous were treated cautiously and given 'assumed important' status in addition to assumed hedgerow HoPI status.

1.4.3 Hedgerow surveys were undertaken in June 2021, between October to November 2021, and in January 2022, these later periods typically being a sub-optimal time of year, due to being outside the typical growing season. It is understood that the absence of non-woody ground flora should not be taken as conclusive proof that the species is not present, or that it will not be present in the future. However, the weather during the beginning of winter going into December 2021 was relatively mild and subsequently it was noted that vegetative remains of species were more likely to still be present (excluding some of the spring evident ground flora species), compared to other typical years. In addition, the clement weather at the start of 2022, allowed for some of the ground flora (typically spring evident) species to be present. As a result, this is not considered to be a major limitation of the hedgerow surveys.

1.4.4 Changes to the Order Limits throughout the survey period affected land access to some land plots. In a few cases, only a portion of the hedge length requiring survey was recorded within the survey data, due to land access restrictions. However, this is not deemed to have significantly

affected the results within this report with a precautionary approach applied where necessary.

- 1.4.5 The initial dataset from hedgerows identified from the Phase 1 habitat surveys in 2020, were reviewed to identify hedgerows for survey. The subsequent changes to the Order Limits meant the information collected on the original list of 159 hedgerows scoped for survey increased to 596 hedgerows once the additional Order Limits and 50m buffer were applied. This number includes newly identified hedgerows, found during the 2021 Phase 1 surveys.
- 1.4.6 Desk study records for botanical species were found to be recorded at too high a resolution (as 6 figure or 10 figure national grid references) and could not be cross referenced accurately with the hedgerow survey locations. This is an omission but is not likely to have significantly affected the results for this survey.
- 1.4.7 This report only considers those hedgerows meeting the Hedgerow Regulations (1997) biodiversity criteria, as required under the DMRB requirements within *DMRB LA 108 Biodiversity (DMRB LA 108)* (Highways England, 2020)<sup>2015</sup>.

## 1.5 Results

### *Desk study*

- 1.5.1 Hedgerows were not often a citation feature in any designated sites within the study area. One designated site, within 200m of the Affected Road Network (ARN), Pallet Hill LWS, was designated for hedgerow habitat amongst other habitats and features.

### *Field survey*

- 1.5.2 A total of 596 hedgerows are identified within the Order Limits and 50m buffer of the Order Limits.
- 1.5.3 A proportion of hedgerows were not subject to survey. Of these, all were assumed to be the hedgerow HoPI and to have the potential to be 'Important'.
- 1.5.4 The results tables focus on the status of hedgerows (i.e., Important Hedgerows and S41 Hedgerows) and they also provide a summary of hedgerow habitat types using the JNCC Phase 1 hedgerow classifications.
- 1.5.5 The results for Routewide and all schemes are provided within the following extents:
- Construction, which comprises of both permanent land-take and temporary land-take areas;
  - Construction boundary (as above) to the Order Limits; and
  - Outside of the Project, which includes a 50m buffer from the Order Limits.
- 1.5.6 The Study Area encompasses all the above extents.

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<sup>20</sup> Highways England (2020) Design Manual for Roads and Bridges LA 108 Biodiversity

- 1.5.7 The Order Limits comprises of the 'Construction' extent and the 'Construction to Oder Limit' extents.
- 1.5.8 It is assumed that all hedges within the Construction extent will be lost during the construction phase.
- 1.5.9 The lengths are all approximate and the results are provided in kilometres (km) to two decimal places and rounded up where appropriate. The symbol '<' denotes where a length is less than 10 metres. All counts and percentages are all also approximate.

#### Routewide

- 1.5.10 The total number of hedgerows within the Order Limits is 596, of which, the number of Important Hedgerows, and S41 Hedgerows within the construction extent is 175, and 317, respectively.
- 1.5.11 The total length of all hedgerows within the study area (all extents) is 86.70km.
- 1.5.12 The total length of hedgerows within the construction extent is 49.16km, of which there is 24.87km and 39.67km, of Important Hedgerows and S41 Hedgerows, respectively.
- 1.5.13 Outside the Project within the 50m buffer from the Order Limits, the total length of hedgerow is 30.74km, of which there is 14.11km and 16.63km, of Important Hedgerow and S41 Hedgerows, respectively.
- 1.5.14 Table 2 and Table 3 below provide a summary of Important Hedgerow and S41 Hedgerow lengths within 'construction' and 'construction to Order Limit' extents for the whole Project.

Table 2: Length of Important Hedgerows and all other hedgerows Routewide

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	22.54	7.71	2.49	2.09
Intact hedge, species-poor	0.08	8.98	-	0.84
Hedge and trees, species-rich	2.18	3.73	0.10	0.71
Hedge and trees, species-poor	0.07	3.87	0.04	0.53
Sub-total lengths (km)	24.87	24.29	2.63	4.17
Extent length (km) totals	49.16		6.80	

Table 3: Length of S41 Hedgerows and all other hedgerows Routewide

Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	27.91	2.35	4.03	0.55
Intact hedge, species-poor	7.22	1.84	0.74	0.11
Hedge and trees, species-rich	3.26	2.64	0.48	0.34
Hedge and trees, species-poor	1.28	2.66	0.35	0.22
Sub-total lengths (km)	39.67	9.49	5.59	1.21
Extent length (km) totals	49.16		6.80	

1.5.15 The total length of hedgerows within the Order Limits is 55.96km.

#### M6 Junction 40 to Kemplay Bank

1.5.16 Below information is provided on the number of hedges, JNCC hedgerow types, hedgerow dimensions, woody species, and associated features within M6 Junction 40 to Kemplay Bank.

1.5.17 The minimum and maximum hedgerow dimensions (length x height x width) in metres (m) are 149.4m x 1.2m x 1m and 156m x 1.3m x 1.2m, respectively.

1.5.18 Woody species with the scheme include: *Fagus sylvatica*; *Fraxinus excelsior*; *Prunus spinosa*; *Sambucus nigra*; *Ulmus species (spp<sup>21</sup>)*; *Ribes uva-crispa*; *Crataegus monogyna*; and *Rosa spp.*

1.5.19 The total number of all hedgerows within the Order Limits is 9, of which, the number of Important Hedgerows, and S41 Hedgerows within the construction extent is 5, and 7, respectively.

1.5.20 The total length of all hedgerows within the study area (comprising of construction; construction to Order Limits; and outside of the Project within a 50m buffer of the Order Limits) is 0.97km.

1.5.21 Table 4 and Table 5 below provide a summary of Important and S41 Hedgerow lengths within 'construction' and 'construction to Order Limit' extents.

<sup>21</sup> Note the term spp. Refers to when either a single species, or more than one species, belonging to the genus stated have been recorded as present. The detail for the specific species of this genus is not required for the hedgerow survey component woody species list.



Table 4: Length of Important Hedgerows and all other hedgerows within M6 Junction 40 to Kemplay Bank

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	0.42	0.03	0.01	-
Intact hedge, species-poor	-	0.02	-	<0.00
Hedge and trees, species-rich	-	-	-	-
Hedge and trees, species-poor	-	-	-	-
Sub-total lengths (km)	0.42	0.05	0.01	<0.00
Extent length (km) totals	0.47		0.01	

Table 5: Length of S41 Hedgerows and all other hedgerows within M6 Junction 40 to Kemplay Bank

Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	S41 Hedgerows within 'construction'	Other hedgerows within 'construction'	S41 Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	0.47	-	0.01	-
Intact hedge, species-poor	-	-	<0.00	-
Hedge and trees, species-rich	-	-	-	-
Hedge and trees, species-poor	-	-	-	-
Sub-total lengths (km)	0.47	-	0.01	-
Extent length totals (km)	0.47		0.01	

1.5.22 The total length of hedgerows within the Order Limits is 0.48km.

1.5.23 At M6 Junction 40 to Kemplay Bank the total length of hedgerows within the construction extent is 0.47km, of which there is 0.42km and 0.47km, of Important Hedgerow and S41 Hedgerows, respectively.

1.5.24 Outside of the Project within the 50m buffer from the Order Limits extent the total length of hedgerow is 0.49km, of which there is 0.30km and 0.49km, of Important Hedgerows and S41 Hedgerows, respectively.



1.5.25 Overall, this scheme had a relatively low number of hedgerows, likely due to the urban areas of Penrith and the presence of large areas of floodplain.

### Penrith to Temple Sowerby

1.5.26 Below information is provided on the number of hedges, JNCC hedgerow types, hedgerow dimensions, woody species, and associated features within Penrith to Temple Sowerby.

1.5.27 The minimum and maximum hedgerow dimensions (length x height x width) in metres (m) are 28.7m x 1.25m x 0.75m, and 340m x 5m x 4.5m, respectively.

1.5.28 Woody species within the scheme include: *Fagus sylvatica*; *Fraxinus excelsior*; *Prunus spinosa*; *Sambucus nigra*; *Crataegus monogyna*; *Rosa spp.*; *Acer campestre*; *Betula pendula*; *Corylus avellana*; *Viburnum opulus*; *Sorbus aucuparia*; and *Ilex aquifolium*.

1.5.29 The total number of all hedgerows within the Order Limits is 20, of which, the number of Important Hedgerows, and S41 Hedgerows within the construction extent is 8, and 17, respectively.

1.5.30 The following hedgerow types were recorded in the Penrith to Temple Sowerby scheme:

- native hedgerow
- native species rich hedgerow
- native species rich hedgerow with trees
- native hedgerow - associated with bank or ditch
- native hedgerow with trees - associated with bank or ditch

1.5.31 The total length of all hedgerows within the study area (comprising of construction, construction to Order Limits and outside of the Project within a 50m buffer of the Order Limits) is 2.56km.

1.5.32 Table 6 and Table 7 below provide a summary of Important and S41 Hedgerow lengths within 'construction' and 'construction to Order Limit' extents.

Table 6: Length of Important Hedgerows and all other hedgerows within Penrith to Temple Sowerby

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	1.01	0.24	0.01	-
Intact hedge, species-poor	-	0.12	-	-
Hedge and trees, species-rich	-	0.64	-	0.04
Hedge and trees, species-poor	-	-	-	-

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Sub-total lengths (km)	1.01	1.00	0.01	0.04
Extent length totals (km)	2.01		0.05	

Table 7: Length of S41 Hedgerows and all other hedgerows within Penrith to Temple Sowerby

Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	S41 Hedgerows within 'construction'	Other hedgerows within 'construction'	S41 Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	1.14	-	0.01	-
Intact hedge, species-poor	0.12	-	-	-
Hedge and trees, species-rich	0.75	-	0.04	-
Hedge and trees, species-poor	-	-	-	-
Sub-total lengths (km)	2.01	0.00	0.05	0.00
Extent length totals (km)	2.01		0.05	

1.5.33 The total length of hedgerows within the Order Limits is 2.06km.

1.5.34 At Penrith to Temple Sowerby the total length of hedgerows within the construction extent is 2.01km, of which there is 1.01km and 2.01km, of Important Hedgerow and S41 Hedgerow, respectively.

1.5.35 Outside of the Project (within the 50m buffer from the Order Limits extent) the total length of hedgerow is 0.5km, of which there is 0.24km and 0.5km, of Important Hedgerow and S41 Hedgerows.

#### Temple Sowerby to Appleby

1.5.36 Below information is provided on the number of hedges, JNCC hedgerow types, hedgerow dimensions, woody species, and associated features within Temple Sowerby to Appleby.

1.5.37 The minimum and maximum hedgerow dimensions (length x height x width) in metres (m) are 18.1m x 0.5m x 0.25m, and 97m x 3m x 2.5m, respectively.

- 1.5.38 Woody species with the scheme include: *Fagus sylvatica*; *Fraxinus excelsior*; *Prunus spinosa*; *Sambucus nigra*; *Crataegus monogyna*; *Rosa spp.*; *Acer campestre*; *Corylus avellana*; *Viburnum opulus*; *Ilex aquifolium*; *Euonymus europaeus*; *Prunus avium*; *Ribes uva-crispa*; *Ulex europaeus*; *Malus sylvestris*; *Salix spp.*; and *Tilia platyphyllos*.
- 1.5.39 The total number of all hedgerows within the Order Limits is 272, of which, the number of Important Hedgerows, and S41 Hedgerows within the construction extent is 80, and 149, respectively.
- 1.5.40 The following hedgerow types were recorded in the Temple Sowerby to Appleby scheme:
- native hedgerow
  - native hedgerow with trees
  - native species rich hedgerow
  - native species rich hedgerow with trees
  - native hedgerow with trees - associated with bank or ditch
  - native species rich hedgerow - associated with bank or ditch
  - native species rich hedgerow with trees - associated with bank or ditch
- 1.5.41 The total length of all hedgerows within the study area (comprising of construction; construction to Order Limits; and outside of the Project within a 50m buffer of the Order Limits) is 40.09km.
- 1.5.42 Table 8 and Table 9 below provide a summary of Important Hedgerow and S41 Hedgerow lengths within 'construction' and 'construction to Order Limit' extents.

Table 8: Length of Important Hedgerows and all other hedgerows within Temple Sowerby to Appleby

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	11.42	3.24	1.07	0.81
Intact hedge, species-poor	0.08	4.76	-	0.37
Hedge and trees, species-rich	0.67	0.64	0.09	0.10
Hedge and trees, species-poor	-	0.98	-	0.31
Sub-total lengths (km)	12.17	9.62	1.17	1.59
Extent length totals (km)	21.80		2.76	

Table 9: Length of S41 Hedgerows and all other hedgerows within Temple Sowerby to Appleby

Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	S41 Hedgerows within 'construction'	Other hedgerows within 'construction'	S41 Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	13.67	0.99	1.64	0.24
Intact hedge, species-poor	3.60	1.25	0.26	0.11
Hedge and trees, species-rich	0.94	0.37	0.08	0.11
Hedge and trees, species-poor	0.57	0.41	0.22	0.10
Sub-total lengths (km)	18.78	3.02	2.21	0.55
Extent length totals (km)	21.80		2.76	

1.5.43 The total length of hedgerows within the Order Limits is 24.56km.

1.5.44 At Temple Sowerby to Appleby the total length of hedgerows within the construction extent is 21.80km, of which there is 12.17km and 18.78km, of Important Hedgerow and S41 Hedgerows, respectively.

1.5.45 Outside of the Project within the 50m buffer from the Order Limits extent the total length of hedgerow is 15.53km, of which there is 7.89km and 14.46km, of Important Hedgerows and S41 Hedgerows.

#### Appleby to Brough

1.5.46 Below information is provided on the number of hedges, JNCC hedgerow types, hedgerow dimensions, woody species, and associated features within Appleby to Brough.

1.5.47 The minimum and maximum hedgerow dimensions (length x height x width) in metres (m) are 37.8m x 1m x 1m, and 99.23m x 5m x 4m, respectively.

1.5.48 Woody species with the scheme include: *Alnus glutinosa*; *Fraxinus excelsior*; *Prunus spinosa*; *Acer campestre*; *Crataegus monogyna*; *Corylus avellana*; *Ilex aquifolium*; *Rosa spp.*; *Betula pendula*; *Salix spp.*; *Malus sylvestris*; *Fagus sylvatica*; *Sambucus nigra*; *Ulmus spp.*; *Ulex europaeus*; *Prunus avium*; and *Quercus robur*.

1.5.49 The total number of all hedgerows within the Order Limits is 136, of which, the number of Important Hedgerows, and S41 Hedgerows within the construction extent is 42, and 70, respectively.

1.5.50 The following hedgerow types were recorded in the Appleby to Brough scheme:

- native hedgerow
- native hedgerow with trees
- native species rich hedgerow
- native species rich hedgerow with trees
- native hedgerow with trees - associated with bank or ditch
- native species rich hedgerow - associated with bank or ditch
- native species rich hedgerow with trees - associated with bank or ditch

1.5.51 In addition the following linear features were recorded:

- line of trees
- line of trees - associated with bank or ditch.

1.5.52 The total length of all hedgerows within the study area (comprising of construction; construction to Order Limits; and outside of the Project within a 50m buffer of the Order Limits) is 17.62km.

1.5.53 Table 10 and Table 11 below provide a summary of Important and S41 Hedgerow lengths within 'construction' and 'construction to Order Limit' extents.

Table 10: Length of Important Hedgerows and all other hedgerows within Appleby to Brough

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	4.30	1.37	0.06	0.60
Intact hedge, species-poor	-	1.25	-	<0.00
Hedge and trees, species-rich	0.86	1.09	0.01	0.08
Hedge and trees, species-poor	0.07	1.64	0.00	0.12
Sub-total lengths (km)	5.23	5.34	0.07	0.79
Extent length totals (km)	10.57		0.86	

Table 11: Length of S41 Hedgerows and all other hedgerows within Appleby to Brough

Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	S41 Hedgerows within 'construction'	Other hedgerows within 'construction'	S41 Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	5.62	0.05	0.66	<0.00
Intact hedge, species-poor	0.73	0.52	<0.00	-
Hedge and trees, species-rich	0.65	1.29	0.09	<0.00
Hedge and trees, species-poor	0.48	1.22	0.11	<0.00
Sub-total lengths (km)	7.49	3.08	0.86	<0.00
Extent length totals (km)	10.57		0.86	

1.5.54 The total length of hedgerows within the Order Limits is 11.43km.

1.5.55 At Appleby to Brough the total length of hedgerows within the construction extent is 10.57km, of which there is 5.23km and 7.49km, of Important Hedgerow and S41 Hedgerows, respectively.

1.5.56 Outside of the Project within the 50m buffer from the Order Limits extent the total length of hedgerow is 6.18km, of which there is 2.50km and 4.72km, of Important Hedgerows and S41 Hedgerows.

### Bowes Bypass

1.5.57 Below information is provided on the number of hedges, JNCC hedgerow types, hedgerow dimensions, woody species, and associated features within Bowes Bypass.

1.5.58 The minimum and maximum hedgerow dimensions (length x height x width) in metres (m) are 56.3m x 1.2m x 1m, and 407m x 5m x 4m, respectively.

1.5.59 Woody species with the scheme include: *Salix spp.*; *Prunus spinosa*; *Corylus avellana*; *Sambucus nigra*; *Sorbus aucuparia*; *Ulmus spp.*; *Carpinus betulus*; *Tilia cordata*; and *Prunus padus*.

1.5.60 The total number of all hedgerows within the Order Limits is 25, of which, the number of Important Hedgerows, and S41 Hedgerows within the construction extent is 4, and 9, respectively.

1.5.61 The following hedgerow types were recorded in the Bowes Bypass Scheme:

- native hedgerow
- native species rich hedgerow
- native hedgerow with trees

- native hedgerow with trees - associated with bank or ditch
- native species rich hedgerow with trees - associated with bank or ditch.

1.5.62 The total length of all hedgerows within the study area (comprising of construction; construction to Order Limits; and outside of the Project within a 50m buffer of the Order Limits) is 2.29km.

1.5.63 Table 12 and Table 13 below provide a summary of Important and S41 Hedgerow lengths within 'construction' and 'construction to Order Limit' extents.

Table 12: Length of Important Hedgerows and all other hedgerows within Bowes Bypass

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	0.12	0.01	0.12	-
Intact hedge, species-poor	-	0.66	-	<0.00
Hedge and trees, species-rich	-	0.37	-	0.10
Hedge and trees, species-poor	-	-	-	-
Sub-total lengths (km)	0.12	1.05	0.12	0.10
Extent length totals (km)	1.16 km		0.21 km	

Table 13: Length of S41 Hedgerows and all other hedgerows within Bowes Bypass

Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	S41 Hedgerows within 'construction'	Other hedgerows within 'construction'	S41 Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	0.12	0.00	0.12	<0.00
Intact hedge, species-poor	0.63	0.03	0.00	-
Hedge and trees, species-rich	-	0.37	-	0.10
Hedge and trees, species-poor	-	-	-	-
Sub-total lengths (km)	0.75	0.41	0.12	0.10



Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	S41 Hedgerows within 'construction'	Other hedgerows within 'construction'	S41 Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Extent length totals (km)	1.16		0.21	

- 1.5.64 The total length of hedgerows within the Order Limits is 1.37km.
- 1.5.65 At Bowes Bypass the total length of hedgerows within the construction extent is 1.16km, of which there is 0.12km and 0.75km, of Important Hedgerow and S41 Hedgerows, respectively.
- 1.5.66 Outside of the Project within the 50m buffer from the Order Limits extent the total length of hedgerow is 0.91km, of which there is 0.3km and 0.42km, of Important Hedgerows and S41 Hedgerows.

#### Cross Lanes to Rokeby

- 1.5.67 Below information is provided on the number of hedges, JNCC hedgerow types, hedgerow dimensions, woody species, and associated features within Cross Lanes to Rokeby.
- 1.5.68 The minimum and maximum hedgerow dimensions (length x height x width) in metres (m) are 60m x 1.5m x 1.5m, and 625m x 5m x 5m, respectively.
- 1.5.69 Woody species with the scheme include: *Alnus glutinosa*; *Fraxinus excelsior*; *Prunus spinosa*; *Crataegus monogyna*; *Corylus avellana*; *Ilex aquifolium*; *Sambucus nigra*; *Sorbus aucuparia*; *Ligustrum vulgare*; *Salix spp.*; *Malus sylvestris*; *Betula pendula*; *Rosa spp.*; *Ulmus spp.*; *Acer campestre*; *Ulex europaeus*; *Prunus padus*; and *Quercus robur*.
- 1.5.70 The total number of all hedgerows within the Order Limits is 38, of which, the number of Important Hedgerows, and S41 Hedgerows within the construction extent is 11, and 13, respectively.
- 1.5.71 The following hedgerow types were recorded in the Cross Lanes to Rokeby scheme:
- native hedgerow with trees
  - native species rich hedgerow
  - native species rich hedgerow with trees
  - native hedgerow with trees - associated with bank or ditch
  - native species rich hedgerow - associated with bank or ditch
- 1.5.72 The total length of all hedgerows within the study area (comprising of construction; construction to Order Limits; and outside of the Project within a 50m buffer of the Order Limits) is 5.86km.
- 1.5.73 Table 14 and Table 15 below provide a summary of Important and S41 Hedgerow lengths within 'construction' and 'construction to Order Limit' extents. In addition,

Table 14: Length of Important Hedgerows and all other hedgerows within Cross Lanes to Rokeby

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	1.57	0.62	<0.00	0.41
Intact hedge, species-poor	-	-	-	-
Hedge and trees, species-rich	-	0.59	-	0.13
Hedge and trees, species-poor	-	0.90	-	0.06
Sub-total lengths (km)	1.57	2.11	0.00	0.60
Extent length totals (km)	3.68		0.60	

Table 15: Length of S41 Hedgerows and all other hedgerows within Cross Lanes to Rokeby

Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	S41 Hedgerows within 'construction'	Other hedgerows within 'construction'	S41 Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	1.50	0.69	0.10	0.31
Intact hedge, species-poor	-	-	-	-
Hedge and trees, species-rich	0.21	0.38	<0.00	0.13
Hedge and trees, species-poor	0.23	0.67	-	0.06
Sub-total lengths (km)	1.94	1.74	0.10	0.50
Extent length totals (km)	3.68		0.60	

1.5.74 The total length of hedgerows within the Order Limits is 4.28km.

1.5.75 At Cross Lanes to Rokeby the total length of hedgerows within the construction extent is 3.68km, of which there is 1.57km and 2.11km, of Important Hedgerow and S41 Hedgerows, respectively.

1.5.76 Outside of the Project within the 50m buffer from the Order Limits extent the total length of hedgerow is 1.57km, of which there is 0.45km and 0.63km, of Important Hedgerows and S41 Hedgerows.

## Stephen Bank to Carkin Moor

- 1.5.77 Below information is provided on the number of hedges, JNCC hedgerow types, hedgerow dimensions, woody species, and associated features within Stephen Bank and Carkin Moor.
- 1.5.78 The minimum and maximum hedgerow dimensions (length x height x width) in metres (m) are 37.6m x 0.75m x 1m, and 852m x 3m x 3.5m, respectively.
- 1.5.79 Woody species with the scheme include: *Alnus glutinosa*; *Fraxinus excelsior*; *Fagus sylvatica*; *Prunus spinosa*; *Sambucus nigra*; *Crataegus monogyna*; *Corylus avellana*; *Ilex aquifolium*; *Rosa spp.*; *Quercus robur*; *Salix spp.*; *Acer campestre*; *Populus tremula*; *Ulex europaeus*; *Malus sylvestris*; *Prunus padus*; *Betula pendula*; *Ribes uva-crispa*; and *Ulmus spp.*
- 1.5.80 The total number of all hedgerows within the Order Limits is 96, of which, the number of Important Hedgerows, and S41 Hedgerows within the construction extent is 25, and 52, respectively.
- 1.5.81 The following hedgerow types were recorded in Stephen Bank to Carkin Moor:
- native hedgerow
  - native hedgerow with trees
  - native species rich hedgerow
  - native species rich hedgerow with trees
  - native hedgerow - associated with bank or ditch
  - native hedgerow with trees - associated with bank or ditch
  - native species rich hedgerow - associated with bank or ditch
  - native species rich hedgerow with trees - associated with bank or ditch
- 1.5.82 The total length of all hedgerows within the study area (comprising of construction; construction to Order Limits; and outside of the Project within a 50m buffer of the Order Limits) is 16.93km.
- 1.5.83 Table 16 and Table 17 below provide a summary of Important and S41 Hedgerow lengths within 'construction' and 'construction to Order Limit' extents. In addition,

Table 16: Length of Important Hedgerows and all other hedgerows within Stephen Bank to Carkin Moor

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	3.81	2.19	1.23	0.27
Intact hedge, species-poor	-	2.16	-	0.47
Hedge and trees, species-rich	0.53	0.40	0.04	0.26

Hedgerow JNCC classification	Length (km) of Important Hedgerows and other hedgerows			
	Important Hedgerows within 'construction'	Other hedgerows within 'construction'	Important Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Hedge and trees, species-poor	-	0.36	-	0.04
Sub-total lengths (km)	4.35	5.11	1.26	1.04
Extent length totals (km)	9.46		2.31	

Table 17: Length of S41 Hedgerows and all other hedgerows within Stephen Bank to Carkin Moor

Hedgerow JNCC classification	Length (km) of S41 Hedgerows and other hedgerows			
	S41 Hedgerows within 'construction'	Other hedgerows within 'construction'	S41 Hedgerows within 'construction to order limits'	Other hedgerows within 'construction to order limits'
Intact native hedge, species-rich	5.40	0.61	1.50	0.00
Intact hedge, species-poor	2.12	0.04	0.47	-
Hedge and trees, species-rich	0.71	0.22	0.26	0.06
Hedge and trees, species-poor	-	0.36	0.02	-
Sub-total lengths (km)	8.22	1.23	2.25	0.06
Extent length totals (km)	9.46		2.31	

1.5.84 The total length of hedgerows within the Order Limits is 11.77km.

1.5.85 At Stephen Bank to Carkin Moor the total length of hedgerows within the construction extent is 9.46km, of which there is 4.35km and 8.22km, of Important Hedgerow and S41 Hedgerows, respectively.

1.5.86 Outside of the Project within the 50m buffer from the Order Limits extent the total length of hedgerow is 5.16km, of which there is 2.28km and 4.38km, of Important Hedgerows and S41 Hedgerows.

#### A1(M) Junction 53 Scotch Corner

1.5.87 There are no Important Hedgerows, S41 Hedgerows or any other hedgerow within the Order Limits.

1.5.88 The length of all hedgerows outside of the Project within a 50m buffer of the Order Limits is 0.39km. The total length of hedgerow within the 50m buffer from the Order Limits extent is 0.39km, of which there is 0.16km and

0.39km, of Important hedgerows and S41 hedgerows, respectively. The minimum and maximum hedgerow dimensions (length x height x width) in metres (m), are 30.9m x 2m x 1.5m, and 169.7m x 3m x 1.5m, respectively. Woody species within scheme include: *Fraxinus excelsior*; *Sambucus nigra*; *Crataegus monogyna*; and *Rosa species*. The following hedgerow types were recorded in A1(M) Junction 53 Scotch Corner: native hedgerow; and native species rich hedgerow.

### Future baseline

- 1.5.89 The ecological baseline conditions described in this report represent those which exist in the absence of the Project and at the time of survey. As stated in Section 3 of Chartered Institute of Ecology and Environmental Management'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.
- 1.5.90 All hedgerows within the Order Limits will be removed during the construction phase and as the construction works are being completed new hedgerows will be planted to replace hedgerows lost. The details of which are outlined within the Landscape and Ecology Management Plan. The specific details of hedge structure, diversity and associated features will be identified during the detailed design stage of the Project.
- 1.5.91 Based on the survey 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 localised movement of certain species and local population changes, however, the overall habitats and species composition in the study area are expected to be broadly similar to that of the existing baseline. Therefore, the future baseline would remain the same as set out in the existing baseline.

## 1.6 Discussion

- 1.6.1 A total length of 86.70km of hedgerows has been subject to survey and assessment.
- 1.6.2 Overall, many of the hedgerows were not in good condition and either had a low diversity of species or were hard grazed up to the edges or generally defunct.
- 1.6.3 Temple Sowerby to Appleby, Appleby to Brough and Stephen Bank to Carkin Moor are the large in size (hectares) and they are also the schemes with the greatest length of hedge within the Order Limits. The total length of hedge within the Order Limits are 24.56km, 11.43km and 11.77km. Conversely, Penrith to Temple Sowerby is a similar size to Stephen Bank to Carkin Moor but has a much lower density of hedgerows. The total length of hedgerow is 2.06km.
- 1.6.4 The landscape at Temple Sowerby to Appleby is dominated by improved grassland mainly used for grazing agricultural purposes, and consequently the hedges are less diverse and more defunct; however, they have been retained in the landscape.

- 1.6.5 The less rural sections of the Project at M6 Junction to Kemplay Bank and A1 (M) Junction 53 Scotch Corner have lower length of hedgerows or no hedgerows altogether within the Order Limits.
- 1.6.6 Of the total length of hedgerows surveyed 48% were recorded to be 'important' under the biodiversity criteria as defined by The Hedgerow Regulations (1997) and 82% were recorded to be Priority Habitat as defined by *UK Habitat Classification*.
- 1.6.7 The most common hedgerow type recorded across the Project was hawthorn, this being reflective of a number of defunct hedgerows across the survey area. Next were hedgerows comprising a mix of hawthorn, ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), field maple (*Acer campestre*), crab-apple (*Malus sylvestris*), elder (*Sambucus nigra*), dog rose aggregate. (*Rosa canina agg*) and bramble aggregate (*Rubus fruticosus agg.*).
- 1.6.8 Stephen Bank to Carkin Moor supported the greatest diversity of woody species, with a total of 19 species recorded within this scheme. The landscape at this scheme is markedly different to the other scheme, where it is dominated by cropland and has established hedgerows with a greater range of associated features.

## 1.7 References

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