

NCN 72 South: Drigg to Millom & Duddon Bridge

Feasibility Study Volume 3: Ecological Desk Study

August 2016



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Executive Summary

Sustrans has been commissioned to establish the feasibility of a new walking and cycling route between Drigg and Millom in west Cumbria. The route will also connect Ravenglass, Hycemoor, Bootle, Whitbeck, Silecroft, Whicham, The Hill, The Green, Halthwaites and Broughton in Furness.

This report makes a desk-based assessment of likely ecological impacts on nature conservation sites, habitats and protected or notable fauna. As no site visit has been undertaken conclusions in this report are provisional and will need to be verified by a site visit prior to a detailed proposal being developed.

This route passes through a landscape with internationally and nationally important habitats and fauna. Of particular note are the coastal and estuarine habitats around the Drigg Coast and Duddon Estuary and populations of natterjack toads, great crested newts, overwintering and breeding birds and notable invertebrates.

The most challenging aspects of the route are the crossings over the Rivers Irt and Esk. New bridges in these locations will span the Drigg Coast Special Area for Conservation (SAC) and Site of Specific Scientific Interest (SSSI) and will result in the loss of priority habitat. Consultation with Natural England at the earliest opportunity is crucial for work around the SAC and SSSI. Bridge design should minimise in-channel impacts and habitat loss for the footings and the bridge location must be selected to minimise the loss of and temporary disturbance to important habitats and to avoid long-term impacts on dynamic habitats such as sand dunes.

A section of the proposed route north of the River Esk has also been identified as a potential constraint of the route development due to its proximity to the Drigg Coast SAC/SSSI and the potential presence of priority habitats. A site visit will determine whether this is a notable consideration of the proposal. Alternate routes are proposed in this location to mitigate impacts.

Construction will be undertaken through an ancient woodland with protection through the planning process through its designation as a County Wildlife Site. Impacts cannot be determined without a site visit to assess the habitats affected by proposed construction. It is anticipated that there may not be scope to wind the path through the woodland to avoid important features due to the steep gradient. If impacts are considered significant, an alternative route along the A595 is proposed.

Important and sensitive habitats could be present elsewhere along the route. The locations and importance of these will need to be identified by a site survey. The exact route alignment should be kept somewhat flexible until this survey has been conducted to enable important habitats to be protected.

Natterjack toad populations which are extremely important nationally are present along the route. Whilst habitats on which they rely will not be directly affected by the proposal, further assessment is required to determine whether route development could result in an increased risk of mortality during migration from path users. It is anticipated that this would not form a barrier to route construction as mitigation can be undertaken to reduce this risk.

Further assessment will be required to assess the potential of future disturbance to birds using Millom Marsh from path users. This will involve a site visit to assess the extent of screening vegetation. Further surveys, consultation and mitigation may be required in relation to this impact.

Various other notable and protected species are likely to be present along the route. Whilst none of these are likely to form a barrier to construction, the additional surveys and mitigation measures required could add to the overall cost of the project and may influence the detailed design.

Current planning policy demands that construction projects not only minimise their ecological impact, but provide enhancements wherever possible. Ecological enhancement measures proportional to the scale of the proposal should be built into the detailed design of the scheme.

1 Background

1.1 Project Introduction

Sustrans has been commissioned to undertake a feasibility study for creating a route for walking and cycling between Drigg and Millom in west Cumbria. The proposed route is approximately 30km in length between National Grid Reference SD 065 990 and SD 091 934. This route also has a link to Duddon Bridge, with an extra 9km of route to SD 197 882. Figure 1.1 shows the approximate route.

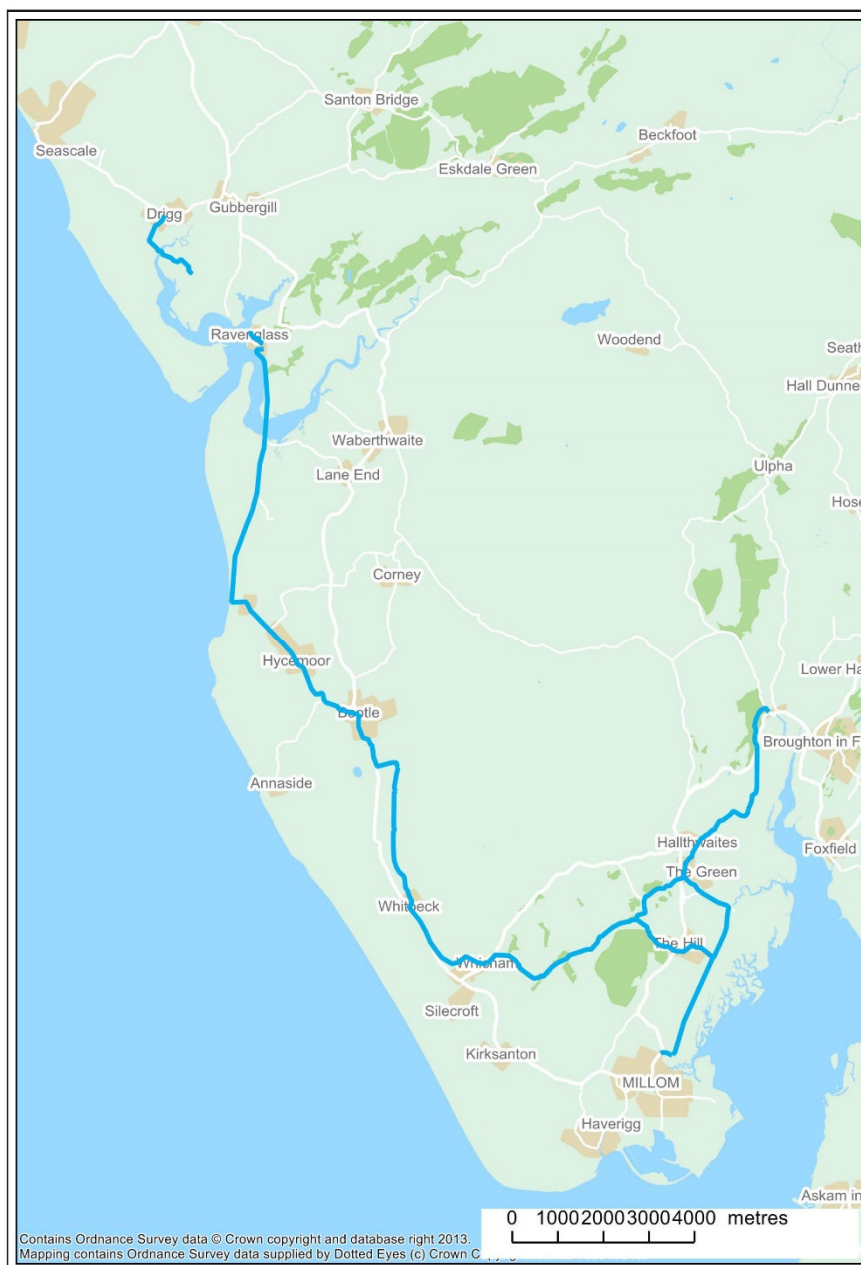


Figure 1.1: Route Proposed

In order to provide an initial assessment of the likely ecological constraints of this proposal, a desk study has been conducted. This assesses the possible impacts of the proposed works on nature conservation sites, habitats and protected or notable fauna. This assessment has not included a site visit and does not constitute a Preliminary Ecological Assessment (in accordance with CIEEM guidelines 2013) but provides an overview of possible ecological issues and constraints for the development.

1.2 Engineering Options

The proposed path is 3m wide path with an all-weather surface. The route utilises a mix of quiet roads, road verges or field margins, existing tracks, footpaths and railway viaducts. An 800m section north of the River Irt is the only section where brand new path is to be created. A new bridge will be required over the River Irt and bridges may be required elsewhere. A summary of all the sections where construction work is proposed are outlined below.

As no site visit has been conducted and a detailed design has not been prepared the exact route alignment is not always known. This is particularly the case where the route follows, but will be segregated from, main roads and could be situated in the verge or adjacent fields and may require the removal of sections of hedgerow and trees. A precautionary approach has been taken in assessing the impacts where applicable in Sections 2, 3 and 4 of this report.

The assessment in this report also considers the potential impact of changes in recreation and land-use elsewhere on the route where no construction is proposed.

The River Irt Crossing

South of Drigg the route will leave the road and follow an existing track to the northwest bank of the River Irt. The existing track then fords the River Irt at SD 064 982 and the route then follows the same track across fields, through a farmyard and re-joins a road at Hall Carleton. A bridge will be constructed over the River Irt. The detailed design and exact location are considered to be flexible. It is anticipated that the track will need resurfacing but no significant construction work. Drainage may need to be improved by work to an existing ditch in this location.

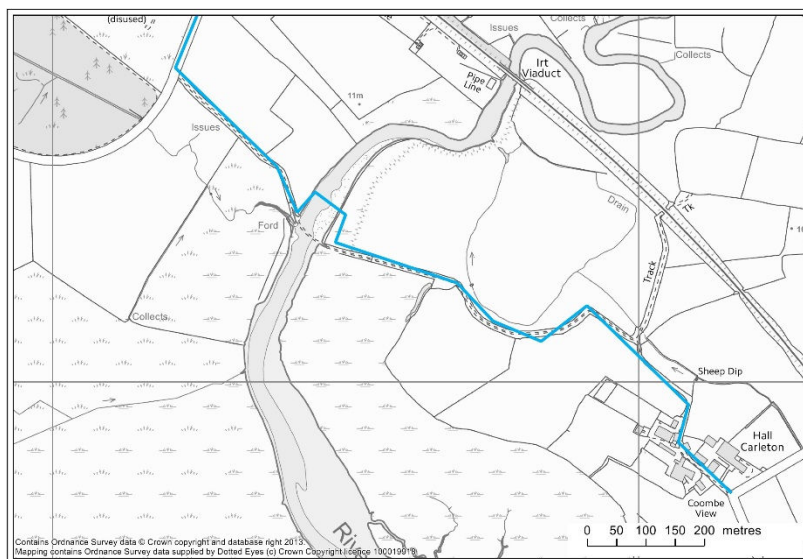


Figure 1.2: River Irt Crossing

Ravenglass to the Eskmeals

Between Ravenglass and Eskmeals the path will require some new construction. In Ravenglass it will use existing paths, then cross a playing field to join Walls Drive. It follows Walls Drive and then the private drive to Brighthouse before crossing fields to SD 088 950 where it crosses under the railway via an existing underpass. It will then run adjacent to the railway on its west side, either through the field or on the railway embankment.

Two alternative route options are proposed in this location utilising other existing underpasses. For the more northerly crossing, the route would cross at SD 087 956. From this point until the viaduct engineering works will be required to take the path up to the level of the railway and to enable the

path to run along the steep railway embankment. The more southern crossing would use another existing underpass at SD 088 948. This would mean that the path would be situated through the field east of the railway rather than to the west.

The existing viaduct may be used to allow the route to cross the River Esk. The path would be situated on the railway embankment then cantilevered off the side of the embankment over the river. An alternative approach would be to construct an entirely new parallel bridge with new footings. Both options are discussed in this assessment.

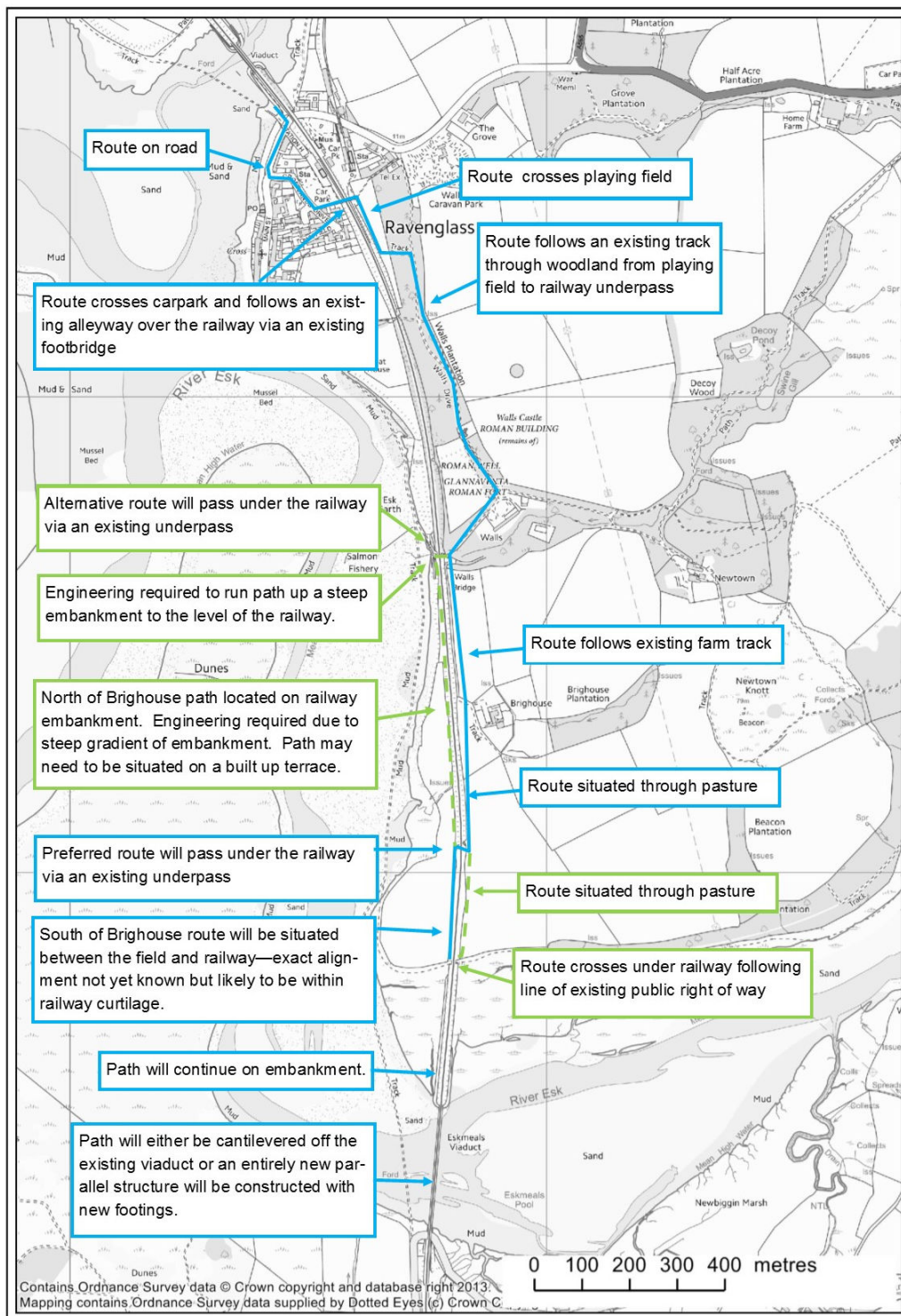


Figure 1.3: Ravenglass to Eskmeals

A595 South of Bootle

South of Bootle the proposed route follows the A595 for 1.3km (Figure 1.4). The route is likely to be segregated from the carriageway but it is not yet known whether the route will be situated in the road verge or adjacent fields or what the implications of this might be. The route will also need to cross the road at some point during this section. It is anticipated that hedgerow and /or tree removal are likely to be required but the extent and locations are unknown. The road also crosses watercourses, the need for engineering in these locations is not yet determined.

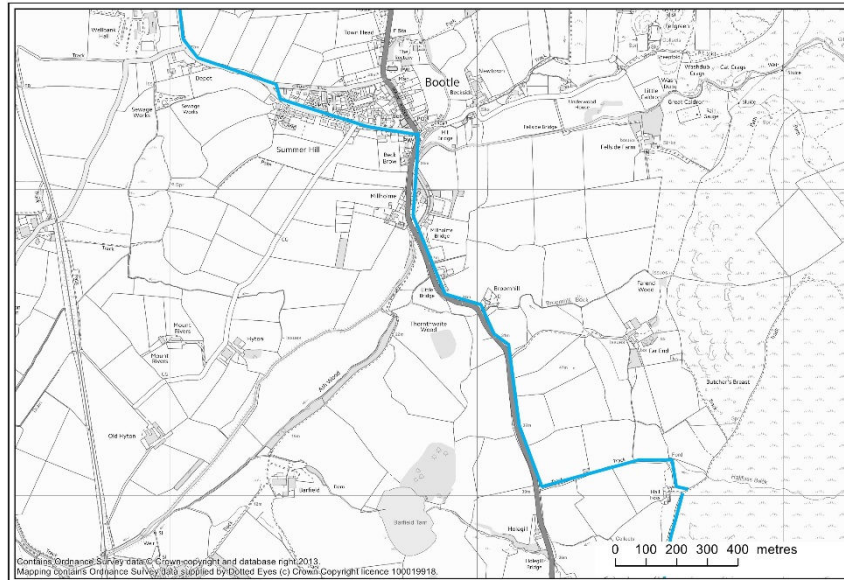


Figure 1.4: South of Bootle

Through Black Combe

The route from the A595 through Black Combe will follow existing paths, tracks and roads (Figure 1.5). Some sections are a footpath only, others provide vehicular access to properties and others have a hard surface. Whether the route requires resurfacing or full construction therefore varies. The route will cross several watercourses. The characteristics of these paths and engineering solutions are not confirmed. For approximately 400m the route will be situated adjacent to the A595. It is anticipated that this will be segregated from the main carriageway in the road verge, but this has not been confirmed.

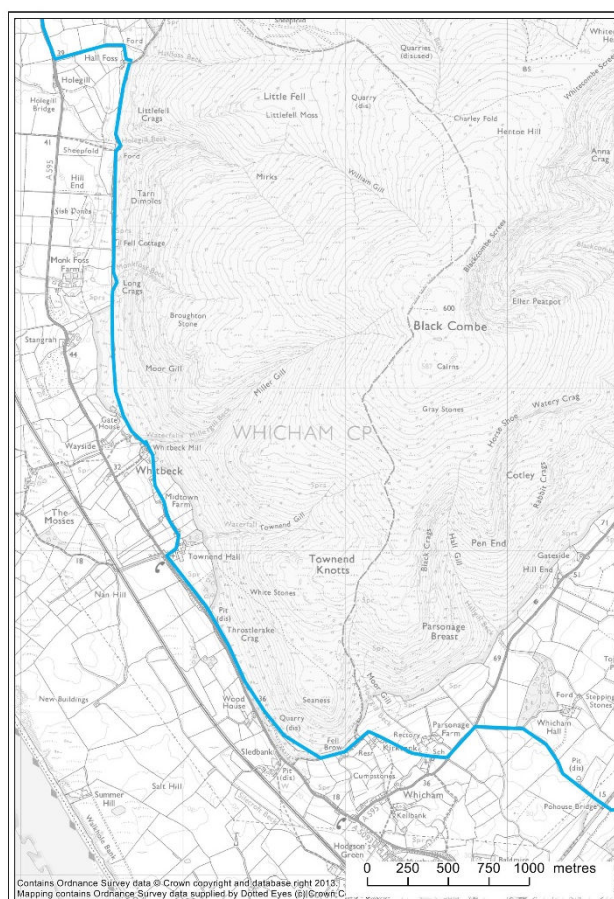


Figure 1.5: Route through Black Combe

A595 around Whicham

The route follows the A595 for 270m at Whicham. Again it is anticipated that the path will be segregated in the verge or adjacent field and will need to cross this road in this section. Hedgerow removal may be required to facilitate this and to provide sufficient sight-lines for the crossing.

The Hill

Through The Hill the route will cross the A5093 and then use an existing alleyway to link on-road sections of the route.

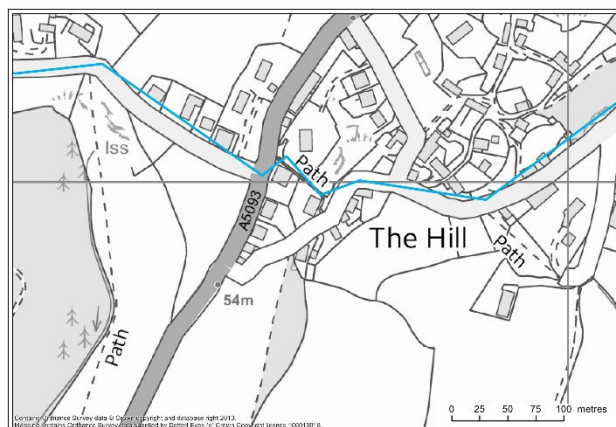


Figure 1.6: Route through The Hill

Adjacent to Millom Marsh

The proposed route will be situated on an existing track for 3.2km adjacent to Millom Marsh. This comprises rough stone and full path construction will be required in this section. The railway is located between the track and marsh.

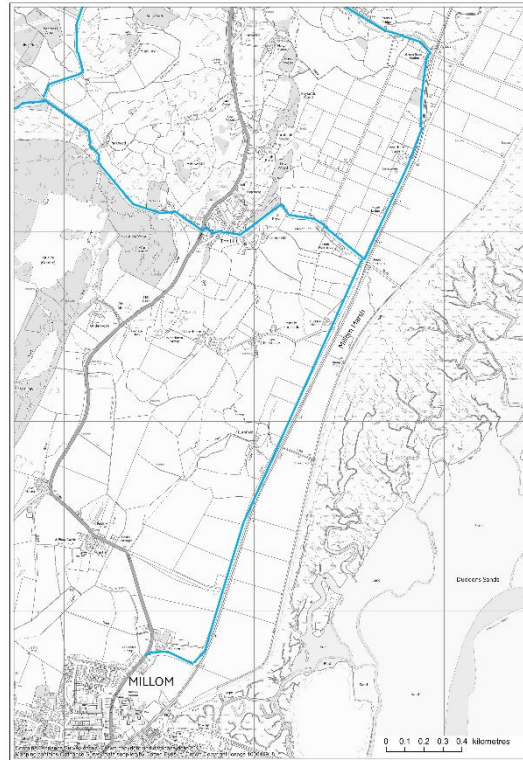


Figure 1.7: Route adjacent to Millom Marsh

A595 near Stanley Wood

For approximately 125m the route will be situated in the verge of the A595 by Stanley Wood and will need to cross the road. The engineering solution proposed here is not known at the time of writing but the path could be in the immediate verge of the road or in the field margin. It is anticipated that the route will be segregated from the main carriageway.

Through Duddon Bridge and Stanley Woodland

The route will follow a public footpath and section of private driveway through Stanley Wood to Duddon Bridge where it re-joins the road. Nothing is currently known about the characteristics of this path. It must therefore be assumed that full path construction with some tree removal and habitat loss may be required. It is anticipated that there may be limited scope to alter the route of the alignment through the woodland due to the steep gradients present, but this cannot be confirmed at the current time.

An alternative route discussed in this report continues along the A595 verge. Again it may be situated in the road verge or field margins. It is anticipated that the verges in this location are wide enough to accommodate a path, but should this not be the case it could be situated in the field margin or could require some hedgerow removal.

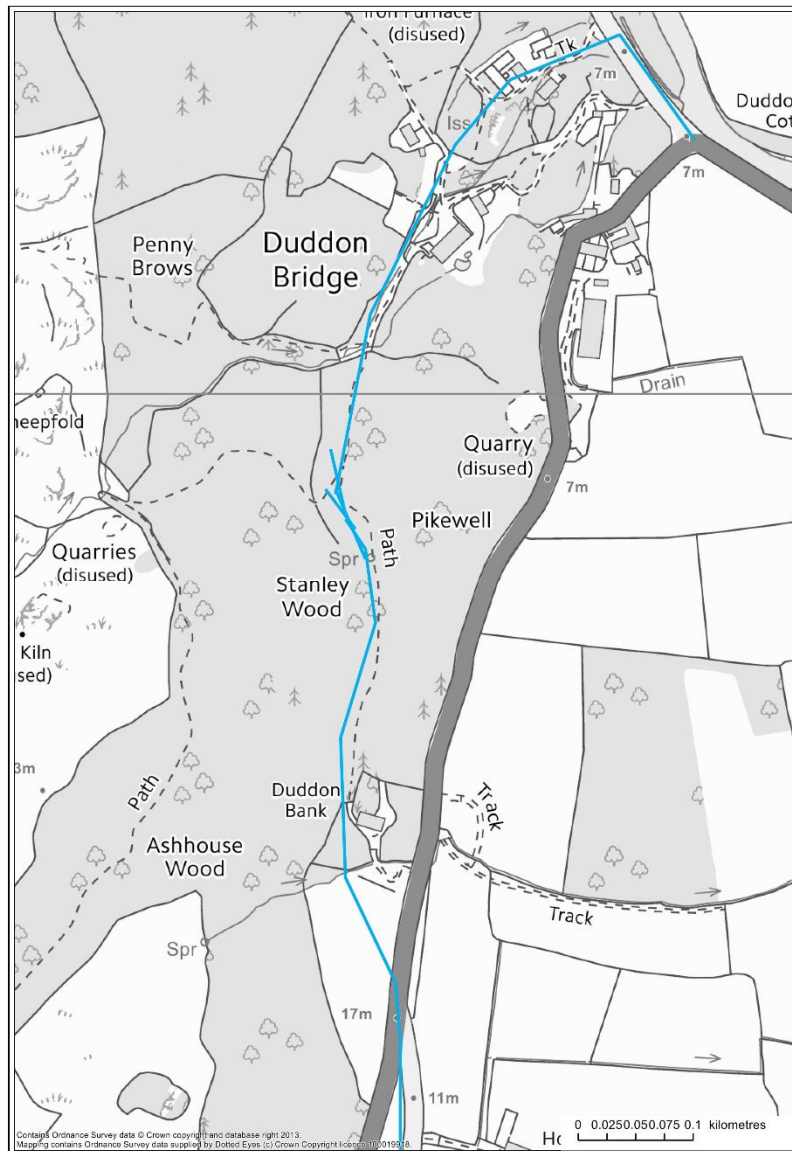


Figure 1.8: Proposed alignment through Stanley Wood to Duddon Bridge

1.3 Ecological Assessment

A desk study has been undertaken to determine likely ecological impacts of the proposal, identify further ecological assessments required and provide an evaluation of whether any ecological features identified might form a barrier or significant constraint to the proposal.

The desk study comprised a data search, an assessment of the likelihood of ecological features being present and an assessment of potential impacts.

The data search identified the presence of any designated nature conservation sites, notable plants and habitats and protected or notable fauna. The following statutory and non-statutory organisations holding ecological data relating to the survey area were contacted;

- Natural England - *MAGIC* website for statutory conservation sites, landscape classification and habitat inventories; and,
- Cumbria Biodiversity Data Centre for records of protected and notable species and the locations of non-statutory nature conservation sites. Citations were obtained for five County Wildlife Sites (CWS), Millom Marsh, Skelda Hill, Williamson Marsh, Duddon and Stanley

Wood, and Lowscales Bank, in order to make a more accurate assessment of potential impacts.

Aerial mapping and photographs of the route have been used to aid assessments of some of the broad habitat types present. An accurate habitat evaluation cannot be made from a desk based assessment such as this, but can inform where further survey and assessment will be required.

Potential impacts on ecological features from the proposed works have been assessed. Where impacts are anticipated, the value of the ecological feature and scale of the impact have been assessed. This has been undertaken in accordance with CIEEM Guidelines for Ecological Impact Assessment (CIEEM 2016). This is considered in light of current ecological legislation and planning policy and so considers impacts on designated nature conservation sites, protected and notable species and landscape scale impacts such as habitat fragmentation.

This report therefore makes recommendations regarding what implications ecology has on the feasibility of the proposed route creation; what further studies would be required and what measures to avoid, mitigate or compensate for ecological impacts are likely to be necessary.

Current planning policy requires developments to include ecological enhancement measures wherever practical. These should be proportionate to the scale of the development and relevant to the wildlife present in the local area. Opportunities for ecological enhancement have been identified where appropriate throughout this document.

2 Nature Conservation Sites

2.1 Baseline Information

2.1.1 Introduction

The majority of the proposed route is situated in the Lake District National Park. The proposed route passes through or is located in close proximity to the Drigg Coast and Duddon Estuary. These are sites of international importance covered by multiple overlapping designations and are described in more detail below. One further site of international importance was identified within 5km of the route; Duddon Mosses, also described below.

The route is also situated close to the edge of Duddon Valley Woodlands SSSI. One further statutory site was identified within 1 km: Drigg Holme SSSI. The nature conservation interest of these sites is described in more detail below.

Thirty County Wildlife Sites (CWS), four Sites of Invertebrate Significance (SIS) and one notable road verge have been identified within 1km of the route. These sites have protection through the planning process only and are listed in Appendix 1 (with the exception of three sites that coincide with sites with statutory protection described below).

2.1.2 Drigg Coast

The Drigg Coast is a site of international importance covered by a series of overlapping statutory designations including The Drigg Coast Special Area of Conservation (SAC), Drigg Coast Site of Special Scientific Interest (SSSI), Drigg Dunes and Gullery; Ravenglass Local Nature Reserve (LNR). Three nature conservation sites with non-statutory sites are also situated within or overlapping the statutory sites; Eskmeals County Wildlife Site (CWS), Drigg Dunes and Coast including Ravenglass Site of Invertebrate Significance (SIS) and Eskmeals Dunes SIS.

These designations cover the Esk Estuary and lower sections of the Rivers Esk, Irt and Mite. The estuarine habitats include extensive mud and sand flats, channels, islets and lagoons. Associated coastal habitats include salt marshes and pastures, salt steppes, sand dunes and beaches, machair and small areas of other habitats such as shingle sea cliffs, bogs, marshes and fens.

The SAC and SSSI designations mostly share the same boundary and cover approximately 1396ha. The primary reason for the SAC designation is the presence of three Annex 1 Habitats;

- **Estuary**; a small bar-built estuary that includes some of the least disturbed transitions to terrestrial habitats in the UK and has good associated animal communities;
- Substantial and ecologically varied areas of **Atlantic decalcified fixed dunes (Calluno-Ulicetea)** including areas dominated by heather *Calluna vulgaris* and bell heather *Erica cineria*, wetter areas dominated by cross leaved heath *Erica tetralix* and large areas of acidic dune grassland with prominent lichen component and areas where sand sedge *Carex arenaria* is present within the moss *Racomitrium canescens*; and,
- A number of **Dunes with *Salix repens* spp. *argentea* (*Salicion arenariae*)** with examples from a range of hydrological conditions grading into more acidic humid dune slacks.

Seven other Annex 1 habitats are also present, but not a primary reason for selection of this site;

- Mudflats and sandflats not covered by seawater at low tide;
- *Salicornia* and other annuals colonising mud and sand;
- Atlantic salt meadows (*Glauco-Puccinellietalia maritinae*);
- Embryonic shifting dunes;
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes);

- Fixed Coastal dunes with herbaceous vegetation (grey Dunes); and,
- Humid dune slacks.

The SSSI designation reflects the national importance of this broad range of maritime habitats and the rich flora it supports. Of particular national significance are the most extensive sand dune system in Cumbria and the largest example of the rare dune heath habitat in England and Wales. The flora includes locally and nationally rare species including sea-kale *Crambe maritima*, Isle of Man cabbage *Rhynchosinapsis monensis*, sea and Portland spurge *Euphorbia paralias* and *E. portlandica*, Rays knotgrass *Polygonum oxyspermum*, adder's-tongue *Ophioglossum vulgatum*, royal fern *Osmunda regalis* and moonwort *Botrychium lunaria*, limestone bedstraw *Galium sternerii*, field gentian *Gentianella campestris*, lax flowered sea lavender *Limonium humile*, saltmarsh flat-sedge *Blysmus rufus* and the slender spike-rush *Eleocharis uniglumis*.

The SSSI designation notes that invertebrates are well represented at the site and include colonies of the the rare dark green fritillary *Argynnis aglaja* and nationally rare weevil *Ceutorhynchus hirtulus* and woodlouse *Armadillidium album*. The local importance of this site is reflected by the designation of two SIS in this area, although no specific information is provided in relation to this designation. The numerous waterbodies on site also support one of the two largest natterjack toad *Bufo calamita* colonies in England, as well as other amphibian species including great crested newt *Triturus cristatus*.

The LNR comprises a significantly smaller proportion of the site located approximately 350m from the proposed route at its closest point. This is designated for its dune habitats, saltmarsh, shingle and strandline habitats and associated fauna including natterjack toads.

The route crosses the SSSI and SAC in three locations; where it crosses the River Irt, the River Mite and the River Esk. The route will be situated in close proximity to the SSSI between Brighthouse and the River Esk and by Eskmeals Ministry of Defence (MOD) site. Given the large extent of the site, the habitats present at each of these points are described in more detail below, in order to provide enough information to assess the ecological impact of the proposed route development.

River Irt Crossing (SD 064 982)

At the River Irt Crossing the route will cross through three ecological units described in the SSSI designation (Units 17, 24 and 19) and in close proximity to Units 18 and 25. These units are summarised in Table 2.1. Reference to Priority Habitat Mapping indicates that the route will cross salt marsh and mudflats and be situated in close proximity to coastal sand dunes and floodplain and coastal grazing marsh.

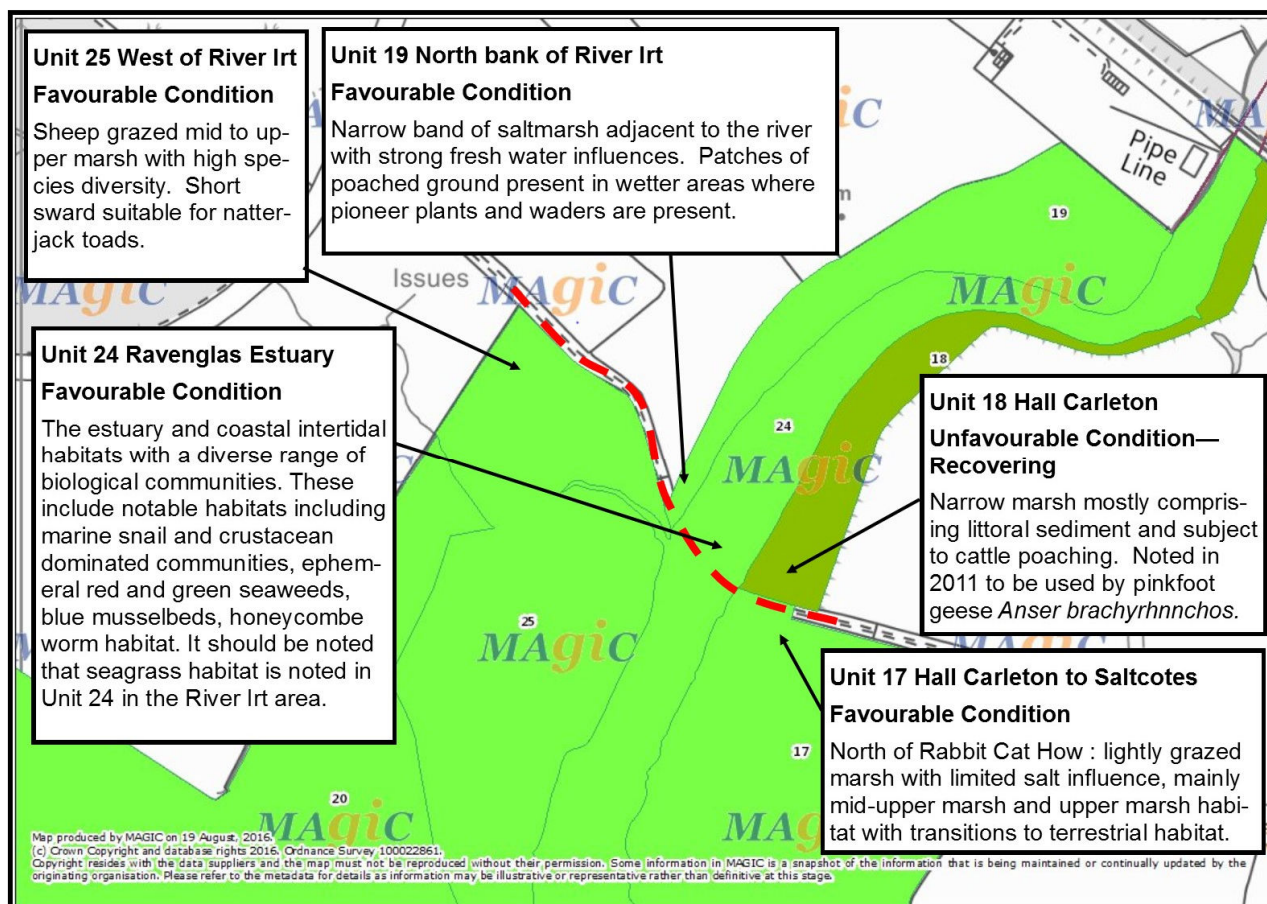


Figure 2.1: Proposed Route and SSSI units at the River Irt Crossing

River Mite crossing at SD 083 967

The route will cross through Unit 24 and in close proximity to Units 11, 15 and 16. These units are summarised in Table 2.2. Reference to Priority Habitat Mapping indicates that the route will cross intertidal foreshore and mudflats and will be situated in close proximity to saltmarsh, coastal and floodplain grazing marsh and Atlantic salt meadows.

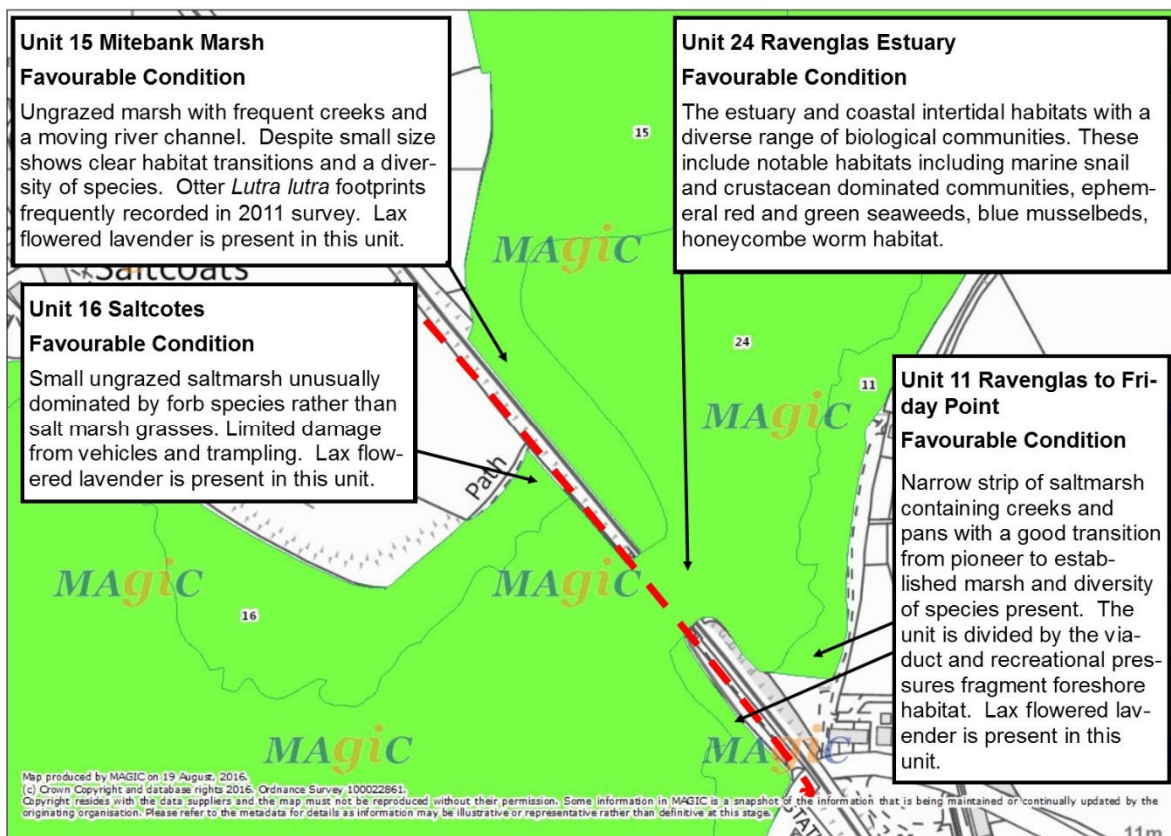


Figure 2.2: Proposed Route and SSSI units at the River Mite Crossing

North of the River Esk Crossing (SD 0875 9569 to SD 0878 9487)

North of the River Esk Crossing the route will be situated between the railway line and the SSSI/SAC boundary, a gap which is between 15 and 150m from the edge of the SSSI/SAC. The units closest to the railway are Units 24 and 11 (summarised in Table 2.3). Habitat inventories indicate that the SSSI/SAC in this location comprises mudflats and salt marsh. The habitat between the railway and SSSI/SAC comprises reedbeds, coastal salt marsh and good quality semi-improved grassland. This section of the site is also designated a SIS due to its invertebrate populations.

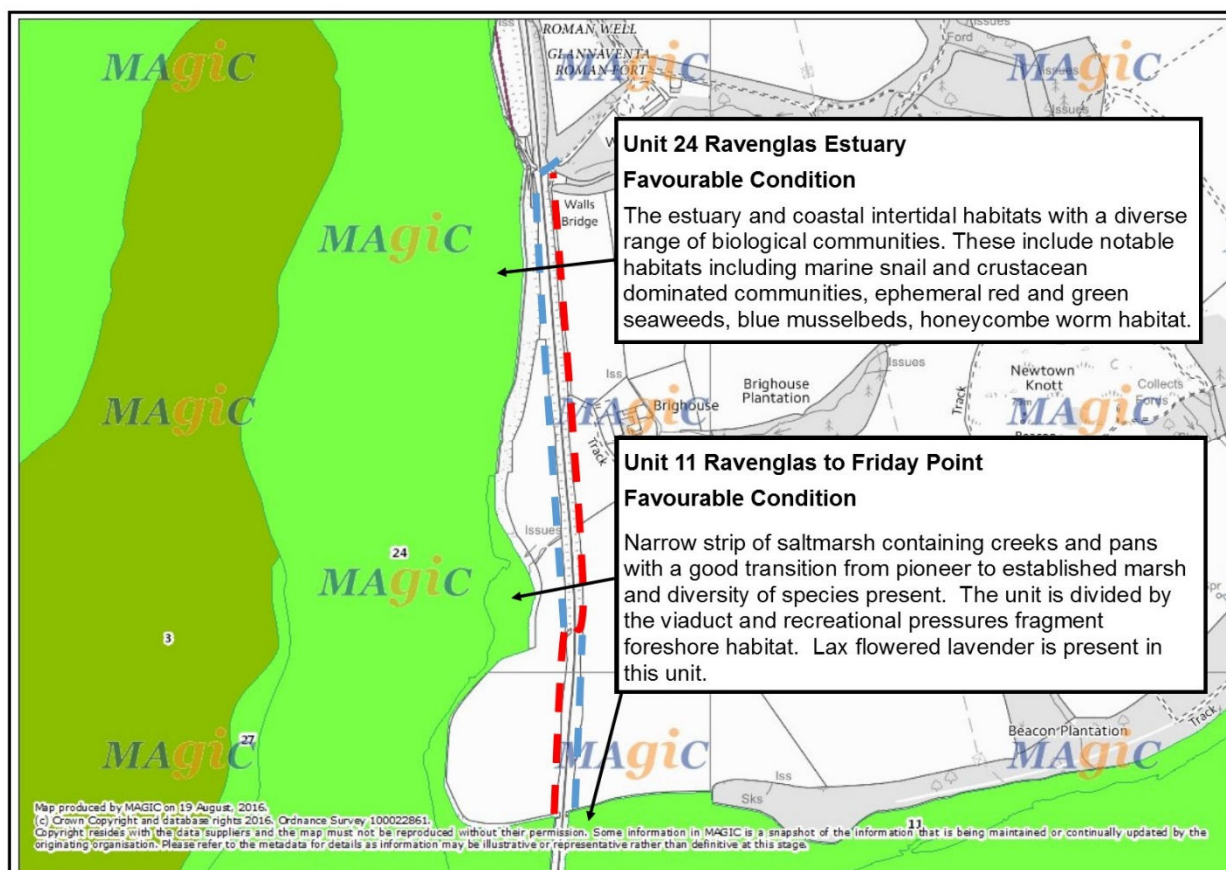


Figure 2.3: Proposed and Alternate Route and SSSI units between Brighouse and the River Esk Crossing

River Esk Crossing (SD 087 944)

The route will cross Unit 24 and be close proximity to Units 11 and 4. These units are summarised in Table 2.4. Reference to Priority Habitat Mapping indicates that the route will cross intertidal foreshore (comprising areas of mud and sand), mudflats, saltmarsh and Atlantic salt meadows and will be situated in close proximity to good quality semi-improved grassland, coastal sand dunes, floodplain and coastal grazing marsh and broadleaved woodland. The SSSI designation notes that a rare community dominated by sea wormwood *Artemisia maritima* occurs on the Esk on a creek bank beyond the reach of grazing cattle. This may refer to a community within Unit 4 although this cannot be confirmed from current information. This section of the site is also designated a SIS due

to its invertebrate populations.

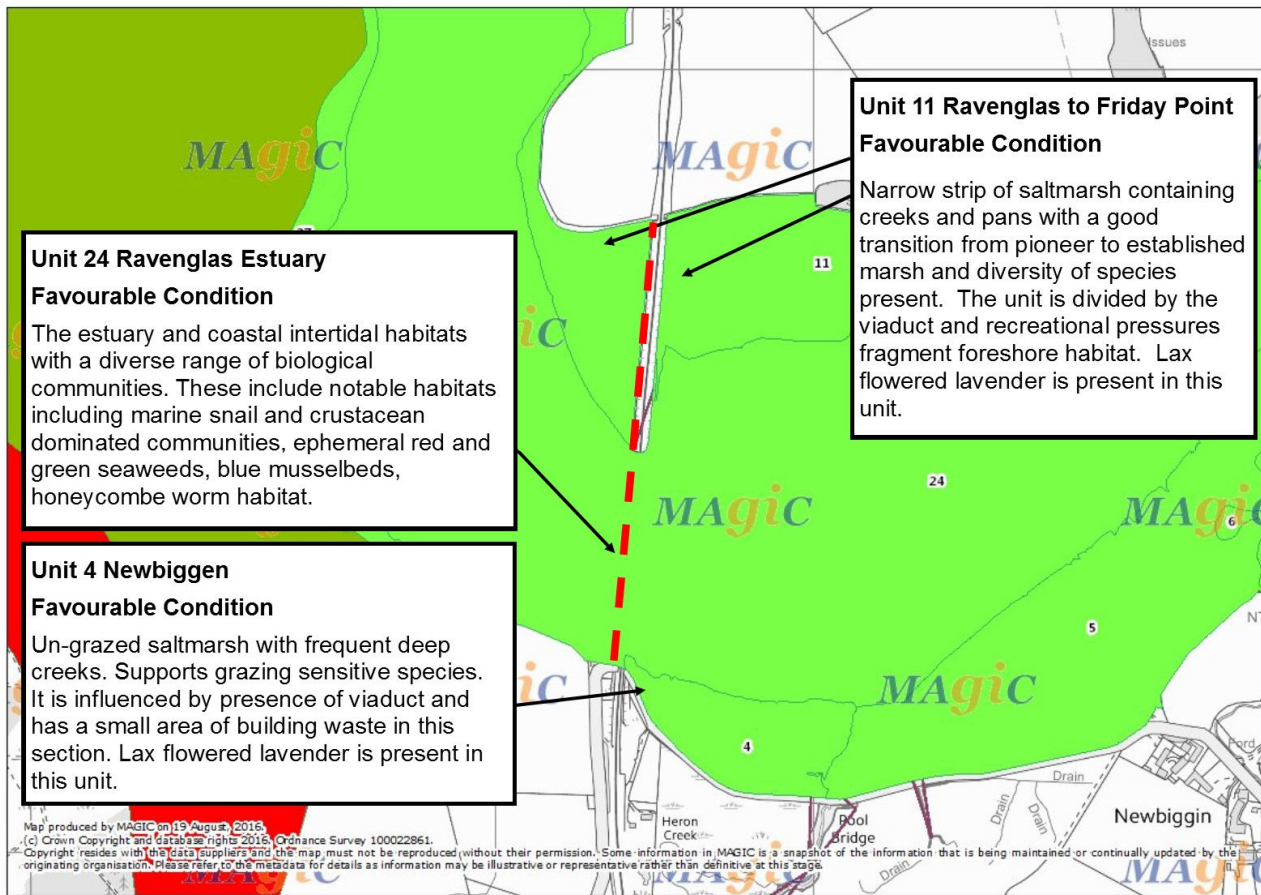


Figure 2.4: Proposed Route and SSSI units at the River Esk Crossing

Eskmeals MOD (SD 081 918)

The route is situated on a road adjacent to the SSSI/SAC at SD 081 918. This is Unit 1 of the SSSI. Habitat inventories list lowland heathland (Atlantic decalcified fixed dunes and dunes with *Salix repens sub spp argentea*) and coastal sand dunes (humid dune slacks and shifting dunes with marram). Eskmeals MOD is also designated a SIS due to its invertebrate populations.

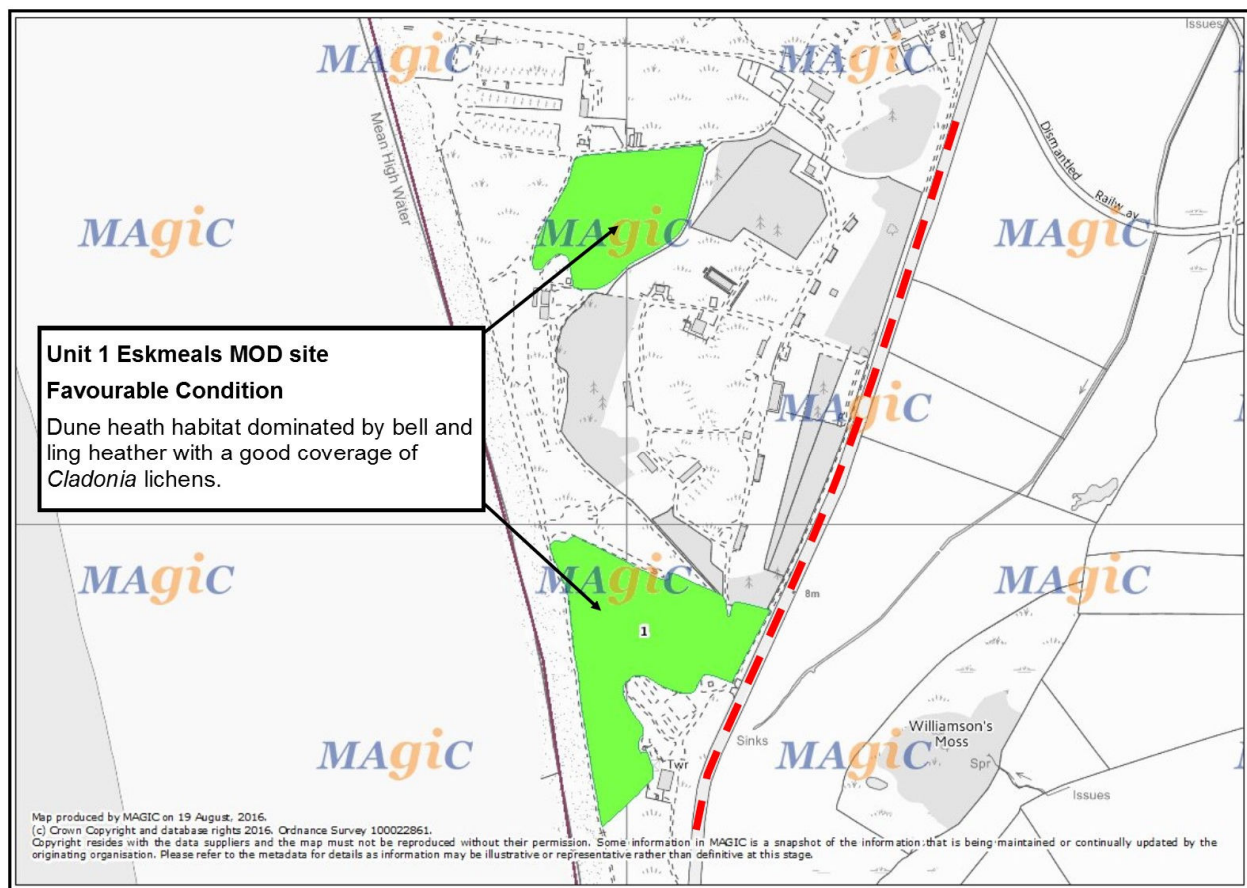


Figure 2.5: Proposed Route and SSSI units at the Eskmeals MOD

2.1.3 Duddon Estuary

Duddon Estuary is covered by a series of overlapping designations including Duddon Estuary Ramsar, Special Protection Area (SPA) and SSSI, Morcombe Bay SAC and Millom Ironworks LNR.

The proposed route will run roughly parallel to the edge of the designated site for approximately 3km north of Millom. The intervening distance will be 100m – 600m. It will also be within 10m of a narrow offshoot of the site for a very short distance. Units 21 and 22 of the SSSI are those that will be closest to the proposed route and these have therefore been described in more detail.

Ramsar sites are wetlands of international importance, Duddon estuary is important for its estuarine and saltmarsh habitats, bird populations and natterjack toad population. The estuary forms an extensive and mobile sand plain and is flanked by saltmarsh and sand dunes. The site is botanically rich and the sand dunes in particular support a diverse range of communities with rare and uncommon plants and invertebrates. The Ironworks contain artificial habitats which also have wildlife interest.

The primary reason for the SAC designation, which covers approximately 282ha, is the presence of nine Annex I Habitats (associated with the estuary, saltmarsh, dunes and vegetated shingle) and one Annex II species (great crested newt). Six other Annex I habitats were also present, but not a primary reason for the designation of the site. These were habitats associated with sandbanks and dunes, reefs and coastal lagoons. The SSSI citation echoes the national importance of these habitats.

The SPA designation reflects the European importance of this site for Annex I bird species. The site regularly supports over 78,000 waterfowl over winter and is particularly noted for its importance to

breeding sandwich tern *Sterna sandvicensis*; overwintering knot *Calidris canutus*, pintail *Anas acuta* and redshank *Tringa tetanus*; and ringed plover *Charadrius hiaticula* and sanderling *Calidris alba* on passage. The SSSI designation also notes that the site supports nationally important populations of overwintering oystercatcher *Haematopus ostralegus*, curlew *Numenius arquata*, dunlin *Calidris alpina*, shelduck *Tadorna tadorna* and red breasted merganser *Mergus serrator*. It notes high tide roosts that are of particular importance to wildfowl and waders. These are mainly further south in the estuary, but include Millom Marsh and Greetygate Marsh located closer to the proposed route. It notes that low tide feeding areas are less well defined and vary depending on the changing pattern of channels and wet sand.

The SSSI designation also notes that this estuary contains one of the most nationally important natterjack toad populations, supporting 18 – 25% of the UK population. Although located relatively evenly through the estuary, particular concentrations occur at the southeast of the estuary and in Millom Ironworks.

The SSSI designation describes the site as being important for its invertebrate population which includes a number of rare and nationally scarce species including the digger wasp *Psene littoralis*, the solitary bee *Colletes cunicularis*, water beetles associated with brackish water *Octhebius marinus* and *O. auriculatus* and moths including the shore wainscot *Mythimna litoralis* and the Portland moth *Ochropleura praecox*.

Unit 21 and 22 of the SSSI are described as extensive areas of marsh heavily grazed by sheep and used by wintering wildfowl. Both units contain a range of vegetation zones although Unit 22 has only limited areas of mid to upper marsh habitats and is dominated by pioneer salt marsh habitat. Natterjack toads are noted to use the upper marsh area in both units. Both units are considered to be in favourable condition. The area of Unit 21 located closest to the route is described as floodplain grazing marsh on priority habitat inventories, similarly unit 22 near the route is categorised as salt marsh.

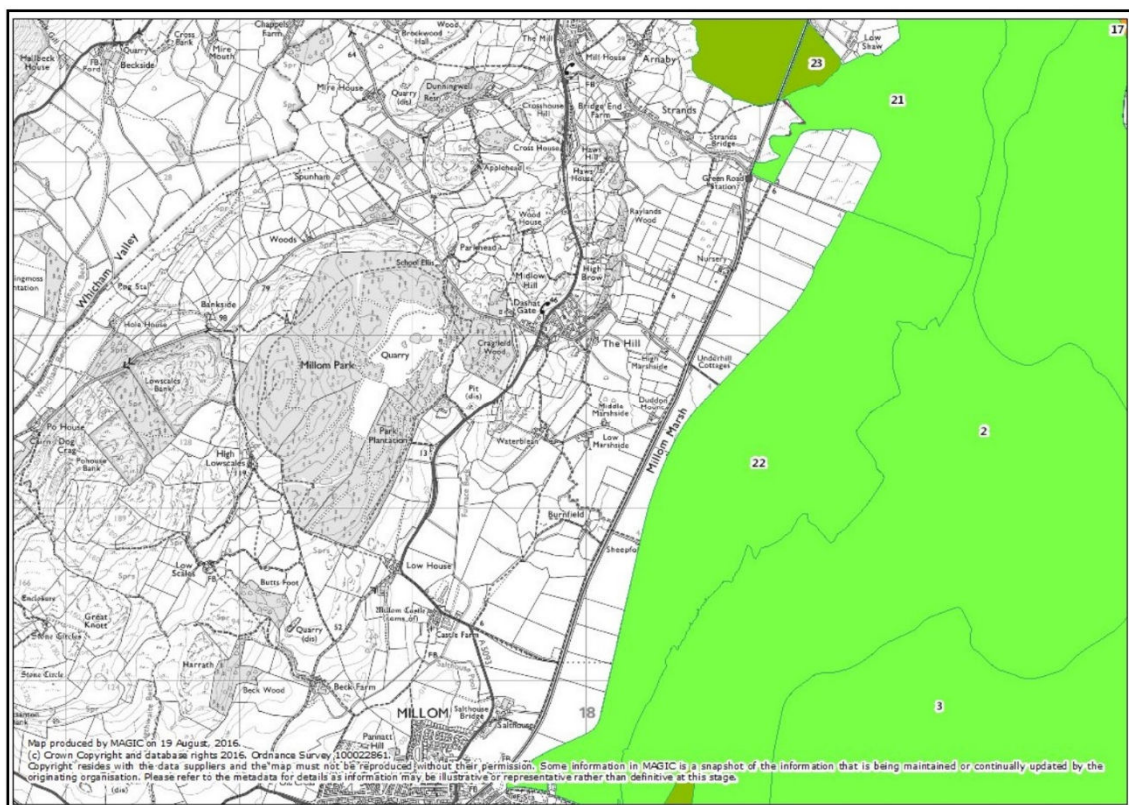


Figure 2.2: Duddon Estuary Habitats and SSSI/SAC/SPA Boundary (MAGIC map)

The section of the site designated as Millom Ironworks LNR is situated approximately 500m southeast of the southern end of the proposed route. The LNR comprises old iron works with large slag piles. These are vegetating with species rich grassland and supports ground nesting birds, butterflies and have a pond in which natterjack toads breed.

2.1.4 Duddon Mosses

Duddon Mosses are a series of eight discreet sites within the Duddon Moss SSSI, some sections of which are also designated a SAC and National Nature Reserve (NNR). These represent the second most important group of mosses in Great Britain due to their size and the diversity of habitats they contain. The SAC designation recognises the international importance of the raised bogs across the site including active and degraded bogs still capable of regeneration.

The sites contain a range of communities including typical bog communities, wet heath, scrub, woodland and acid grassland. Peat cutting has affected all the mosses to varying extents. The Arneby/Shaw moss is that situated closest to the proposed route. The SSSI boundary is situated 250m from the proposed route, the SAC boundary 300m and the NNR 2.8km. The Arneby and Shaw mosses are in unfavourable but recovering status. These mosses contain dry and wet woodland and lagg (typically a bog edge habitat dominated by soft rush *Juncus effuses*, Yorkshire fog *Holcus lanatus*, common bent *Agrostis capillaris*, creeping buttercup *Ranunculus repens* and field woodrush *Luzula campestris*). Rhododendron *Rhododendron* sp. and azalea *Azalea* sp. are non-native invasive species present in one unit of these mosses.

The mosses are noted for supporting breeding birds (such as nightjar *Caprimulgus europaeus*, woodcock *Scolopax rusticola* and curlew), amphibians, reptiles and a rich invertebrate fauna. Three notable beetle species have been recorded in the Arneby and Shaw Mosses; *Anoplus robori*, *Cryptocephalus parvulus* and *Notaris bimaculatus*.

2.1.5 Duddon Valley Woodlands SSSI

The Duddon Valley Woodlands SSSI is a series of sites which form one of the most extensive series of woodlands in Cumbria. Situated in a narrow valley the character of the woodland varies significantly between sections. The route will be situated approximately 60m from Low Wood and Furnace Wood (Unit 25) and on a road adjacent to Duddon Bridge (Unit 26).

Units 25 and 26 comprise upland broadleaved, mixed and yew woodland. Unit 25 is in unfavourable condition due to deer grazing preventing regeneration and resulting in a reduced age spectrum of trees and due to the presence of rhododendron. Unit 26 is also classed as being in unfavourable condition due to the abundance of sycamore *Acer pseudoplatanus* and the presence of snowberry *Symphoricarpos alba* and rhododendron but is recovering.

2.1.6 Drigg Holme SSSI

Located 0.8km from the route at SD 075 988 Drigg Holme comprises neutral grassland favourably managed as a traditional hay meadow. It is bound on two sides by the river and divided by species rich hedgerows. It is the second most species rich grassland site in Cumbria with unimproved, semi-improved and improved sections and includes wet and dry areas.

2.1.7 Lake District National Park

The route between SD 064 983 south of Drigg and SD 145 824 south of Whicham is within the Lake District National Park. National parks are designated to protect landscape, wildlife and cultural heritage. The fells of the Lake District represent a significant proportion of England's dry upland heath, wet heath, blanket bog and mire. Its arctic-alpine habitats on rocky outcrops and scree, species rich grassland, limestone pavements, freshwater and woodland habitats are also of note for wildlife conservation.

The National Park supports populations of otter *Lutra lutra*, dormouse, *Musciadinus avellanarius* eight species of bat, the great crested newt, natterjack toad, vendace *Coregonus vandesius* floating water plantain *Luronium natans* and nationally important populations of red squirrel *Sciurus vulgaris* and red deer *Cervus elaphus*.

2.1.8 Non-Statutory Sites

Thirty County Wildlife Sites (CWS), four Sites of Invertebrate Significance (SIS) and one Notable Road Verge have been identified within 1km of the route. These are listed and a summary of each provided in Table A1 in Appendix 1 (with the exception of the three sites already described as they coincide with sites with statutory protection).

These sites variously comprise woodlands, moors and mires, coastal floodplain grazing marsh and other smaller areas of habitat such as fens and standing water. Natterjack toad populations are also an important reason for the designation of some sites.

2.2 Likely Impacts

The potential for the proposal to impact the six statutory sites and thirty-five sites with non-statutory protection is discussed below. This considers direct impacts, disturbance and long-term influences from the change in land use on the features for which the sites are designated.

2.2.1 Drigg Coast

The route crosses or is located in close proximity to the SSSI/SAC in five locations, the impacts at each of these locations is discussed below.

River Irt Crossing

Bridge Construction will be required over the River Irt in this location. The impact of this on ecology will depend entirely on the bridge design. Consideration should be given to direct habitat loss from the footings and supports, temporary habitat loss from construction work and long-term impacts from scour and hydrological changes from any in-channel structures. A detailed assessment of these impacts on habitats and associated species will be required and impacts will need to be sufficiently mitigated for this option to proceed.

In its currently proposed location, bridge construction would be likely to affect saltmarsh and sand dunes within the SSSI unless the works footprint and bridge footings could be restricted entirely to the footprint of the existing track. Depending on the importance and proportion of the habitat to be affected and the species it supports, this could be a significant impact of the proposal. Consideration would also need to be given to the long-term effects of bridge construction may be on the sand dunes and their associated species, as they are mobile habitats affected by wind and water processes.

The impact from shading on habitats would be likely to be minimal, but this should be confirmed by an assessment by a marine ecologist, particularly given the presence of seagrass habitats in the River Irt area, not noted elsewhere in the SSSI designation. Should any supports be proposed in the river, scour assessments would also be necessary.

A free spanning bridge that avoids any construction in the saltmarsh, mudflats or sand dunes may be feasible slightly upstream of this location and would significantly reduce impacts. This would still result in loss/disturbance of floodplain grazing marsh. This is a priority habitat but is situated outside the designated site and is an extensive habitat so only a limited proportion would be affected. The significance of this impact would depend on the composition of the sward in this location and the surrounding area.

It should also be noted that suitable habitat for natterjack toads is present in this location. This species will need to be protected during construction and in the long-term from path users. This is discussed in more detail in Section 4.2.

River Mite Crossing

The section of route across the River Mite estuary uses an existing section of National Cycle Network. No engineering is currently being proposed and no significant changes are anticipated in land use. No impacts are therefore anticipated on the designated site or associated habitats and species in this location.

A recommendation is being made for the path to be widened but this does not form part of the current proposal. Assuming machinery can be brought in along the path and does not need to work from adjacent habitats, it is anticipated that widening the path would not directly impact habitats at the base of the embankment or under the viaduct (those listed in the SSSI designation or priority habitats). An inspection of the vegetation to be affected would be required, but unless significant species were noted in this location the work would be unlikely to have a significant ecological impact.

Between Brighthouse and River Esk

The route proposed west of the railway appears to be situated outside the boundary of the SSSI/SAC. If the preferred option were used, the railway crossing would be 50m from the SSSI boundary.

This and the southernmost crossing option would both be situated in close proximity to the boundary of the SSSI that includes the River Esk. The southernmost crossing would be situated right on the boundary and could require machinery to access the SSSI.

If the northernmost railway crossing option were used, construction could be required within 10m of the boundary and on the very edge of the terrestrial habitat and landscaping or significant engineering may be required to build up the surface. Access for machinery may therefore be necessary in the SSSI. Although situated outside the boundary, habitat inventories indicate that construction may affect a small area of Atlantic coastal meadow and/or reed bed habitat, which, depending on its quality could be considered an integral part of the habitat complex within the SSSI, albeit a very small proportion of the overall habitat available.

The extent to which important habitats and species will be affected cannot be determined in this location without further survey, detailed design and information relating to construction (access and works area). If the loss or disturbance to important habitats and species cannot be avoided or sufficiently mitigated, this section of the proposal could form a significant barrier to the proposal.

Using the preferred or southernmost crossing point would be likely to significantly reduce the ecological impact of the proposal in this location and would be a preferred option, although this must be confirmed by an ecological survey that includes a habitat assessment.

River Esk Crossing

The route crosses the River Esk in the location of an existing rail viaduct. Engineering options in this location are to cantilever the path off the existing viaduct or to construct a parallel bridge with new footings.

If the path is cantilevered off the existing viaduct, no impacts are anticipated on the habitats below the bridge and the additional shading would be considered negligible. The habitat loss within the SSSI at either end of the viaduct would also be negligible. This option would not result in a significant impact to the SSSI/SAC.

If a parallel bridge were to be created, the impact would be significantly greater. There would be habitat loss associated with the footings and if in-channel supports were proposed there would be

potential for impacts to the in-channel habitats resulting from construction, scour or hydrological changes. The footings are likely to be situated in priority habitats wherever they are located, although the rarity and importance of habitats and the proportion affected would vary depending on the bridge location and design. The works footprint would also be very likely to result in temporary disturbance to priority and/or rare habitats with potential for long-term damage if construction were not properly managed. A habitat survey will be required to determine the significance of impacts. Sympathetic design and construction could reduce the ecological impact of this option to an acceptable level but may require significant survey and mitigation effort.

Adjacent to Eskmeals MOD site.

The route is situated on a road adjacent to the SSSI/SAC this location and no construction is proposed. The change in use of the road with increased cycling and walking is not anticipated to impact the habitats or notable invertebrate species associated with the site. An assessment is required to determine whether natterjack toads, if present in this location, could suffer increased mortality during migration from increased bicycle traffic. This impact is discussed further in Section 4.2.

2.2.2 Duddon Estuary Ramsar, SAC, SPA, SSSI

Parallel to Unit 22, beside Millom Marsh, the proposed route follows an existing road for 3.2km and an existing path for approximately 0.6km. The path will require full construction. The land between the site and the proposed route comprises flood plain grazing marsh, a flood embankment and a railway line. Given the small scale of the works and the intervening distance and features, no impacts are anticipated on habitats and no disturbance would be anticipated to birds using the salt marsh during construction or in the long-term, although consideration must be given to whether the birds using the intervening fresh marsh (Millom Marsh) could be disturbed. Consideration must also be given to whether natterjack toads may routinely cross the track and could be subject to an increased risk of mortality from increased bicycle traffic. Impacts on birds and natterjack toads are discussed in more detail in Section 4.

The route will be within 10m of a narrow offshoot of Unit 21 for a very short distance. It will be situated on road and on an existing path which will be upgraded in this section. The railway and station infrastructure are present between the path and marsh and so again, no impacts are anticipated to habitats or bird populations.

The route is over 300m from other units and the intervening habitats comprise agricultural land. As such no impacts would be anticipated from the route development in those sections.

Duddon Mosses SAC, SSSI

No impacts are anticipated on the habitats or fauna associated with this site. This is due to the distance between the route and the site, the nature of the intervening habitats and because the route is predominantly situated on road in this area and engineering requirements are anticipated to be minimal. No further survey or assessment is required in relation to this site.

Duddon Valley Woodland SSSI

Where the route is situated within 100m of this SSSI it will be situated on surfaced access roads with no construction proposed. As such no direct impacts will result from the proposal. No long-term disturbance would be anticipated to the wildlife using the site from users of the path as the woodland vegetation forms a natural screen. Wildlife within the SSSI would be likely to use Stanley Wood CWS, which is continuous with the SSSI. Impacts on the CWS are discussed below.

Drigg Holme SSSI

This site is designated for the habitats it supports. Given it is located 0.8km from the route, and that the proposed works are limited in scale, no impacts are anticipated on these habitats.

Lake District National Park.

The purpose of National Parks are to conserve and enhance distinctive landscapes and to promote public enjoyment of them. As such, the access improvements along this route will be of benefit to the National Parks aims and objectives unless a significant negative ecological impact were anticipated from the works.

A benefit of route development could be to provide an improved signage scheme to, along and from the route to enable visitors to navigate the nearby sights of interest sustainably.

2.2.3 Non statutory sites

Direct construction impacts are anticipated on one non-statutory designated site: Duddon Bridge and Stanley Wood CWS. Potential impacts could also be anticipated on the wildlife using two other non-statutory sites during the construction and operational phases: Millom Marsh CWS and Skelda Hill CWS. These sites are discussed in more detail below.

No impacts are anticipated on other non-statutory sites during construction or during the operational phase of route creation. This is because they are situated further from the route or comprise habitats and support species that are less sensitive to disturbance or operational impacts. The reasons are summarised for each site in Table A1.1 in Appendix 1.

Duddon Bridge and Stanley Wood CWS

Direct impacts are anticipated on Duddon Bridge and Stanley Wood CWS. New construction is required along an existing track/path. Without a site visit the impacts on the woodland cannot be assessed but could include the removal of trees, damage to the root system of trees and the loss of ground flora. As this is an ancient woodland of county importance this could be a significant impact of the proposal although the proportion of the habitat that would be affected is low. The impacts must be assessed in more detail following a site visit. Given the steep gradients within the woodland, it is not known whether the route could be flexible to avoid ancient trees or areas of notable ground flora if these were present. As such, this section of the route may pose a constraint on this section of the route creation. Consideration could be given to avoiding this woodland altogether by using the road verges or field edges to the east of the A595.

The west verge of the A595 by Duddon Bridge would still be within or adjacent to this site and ancient trees or notable ground flora could be present. It also contains Japanese knotweed, an invasive, non-native species that could be spread by construction work. Measures to prevent the spread of Japanese knotweed can be readily implemented. Measures to protect any ancient trees or notable ground flora would also be required if construction were proposed in this verge.

Millom Marsh CWS

Whilst no direct impacts are anticipated on Millom Marsh, it is noted to be important for its natterjack toad population and for foraging and roosting birds at high tide. The track on which the route will be situated, within 15m of this site, will require construction work to bring it up to an appropriate standard and is currently not open to the public and so will see increased levels of usage. As such there may be an increased risk of harm to natterjack toads and disturbance to birds during the construction and operational phases of the proposal. These impacts are discussed in more detail in Section 4.

Skelda Hill CWS

Skelda Hill is designated due to its breeding natterjack toad population. The route is situated on road where it passes this site and no construction is required. However, further assessment will be required to determine whether the increased pedestrian and cycle traffic would pose a significantly increased risk of toad mortality during migration times.

2.3 Conclusions

The majority of the proposed route is situated in the Lake District National Park. The proposed route passes through or is located in close proximity to the internationally important Drigg Coast and Duddon Estuary. These sites are also covered by other multiple overlapping designations of national and local importance including SSSI status. Two additional SSSI and thirty-five sites with non-statutory designations are present within 1km of the route.

Direct impacts can be anticipated on the Drigg Coast SAC. This is designated for the habitats it contains. It also supports diverse and notable plant species and communities, an important invertebrate population and natterjack toads. Construction of a section of path and two bridges are proposed in this site. It is anticipated that with appropriate survey and design, the ecological impacts of construction can be kept to a minimum with no significant effect on the nature conservation importance of this site or its wildlife populations. This report has also identified that further consideration must be made to determine whether, without appropriate mitigation, there might be a risk of increased natterjack toad mortality from users of the path. Again it is anticipated that with appropriate mitigation this impact can be reduced to a non-significant level. Further surveys, consultation and sympathetic design will be necessary though this designated site.

No direct impacts are anticipated on the Duddon Estuary SAC/SPA but consideration will need to be given to whether the land use change will cause increased natterjack toad mortality or disturbance to the internationally important bird populations, particularly at Millom Marsh. These issues are shared with other areas of the route and discussed in more detail in Section 4.

Direct construction impacts are anticipated on one non-statutory designated site: Duddon Bridge and Stanley Wood CWS. Impacts cannot be quantified without a habitat survey and so an alternative route has been proposed. Potential impacts could also be anticipated on the wildlife using two other non-statutory sites during the construction and operational phases: Millom Marsh CWS and Skelda Hill CWS. Namely, risk of increased natterjack toad mortality near both sites and disturbance to birds foraging and roosting on Millom Marsh. Again, these impacts are discussed in more detail in Section 4.

Ensuring construction within the Drigg Coast SAC/SSSI does not have negative ecological impacts and investigating and reducing risk to natterjack toads and disturbance to birds on Millom Marsh will be the greatest ecological challenges of route creation. These designated features are considered unlikely to be a barrier to construction, however, the appropriate survey, consultation and sympathetic design and construction required will all have associated costs and time implications.

Natural England consent is required for all work that could affect the nature conservation interest of the SAC and SSSI.

2.4 Recommendations

- All construction within the Drigg Coast SAC/SSSI must be subject to survey, consultation and sympathetic design to minimise the ecological impacts. The footprint of the bridges, works areas and access routes and the surrounding habitat must be subject to a habitat assessment and may require more detailed botanical survey depending on the findings of a Preliminary Ecological Appraisal. Dependent on the detailed design of the proposed bridges a scour risk assessment and Water Framework Directive Assessment may be needed. Natural England consent is required for all work within and adjacent to this site and they

should be consulted with regards to the location and design of bridges and other construction at the earliest possible opportunity.

- A habitat assessment will need to be undertaken along the route of the proposed path, in particular through Stanley Wood and Duddon Bridge, to determine the importance of and potential impact on woodland habitats. Important habitats (such as areas of notable ground flora or any ancient trees) should be protected where possible. Consideration could be given to using an alternate route alongside the A595 and avoiding this woodland if impacts are considered to be significant.
- Specific recommendations in relation to birds and natterjack toads are provided in Section 4.

3 Plants and Habitats

3.1 Baseline Information

3.1.1 Surrounding Landscape

The majority of the route is situated within the West Cumbria Coastal Plains National Character Area (NCA). This encompasses the coastal and estuarine habitats and farmland on the adjacent plains. Sections around Black Combe and the northern end of the route are within the Cumbria High Fell NCA.

The landscape is dominated by farmland with small settlements. The coastal and estuarine habitats are a major influence on the landscape and large tracts of heathland, moorland and blanket bogs are also present. Reference to habitat inventories indicate that large swathes of the surrounding countryside comprise priority habitats listed on the UK Biodiversity Action Plan and that form the basis of the list of habitats protected by the NERC Act (2006).

Many of these have already been described in Section 2 as they are situated within designated nature conservation sites. Coastal habitats (coastal and floodplain grazing marsh, salt marsh, sand dunes and mudflats) dominate the coast, estuaries and river floodplains.

Black Combe comprises a large area of upland heathland, grass moorland and blanket bog with other associated habitats such as dry heaths, upland flushes, fens and swamps. Shaw Moss, as described in its citation, is dominated by lowland raised bog and purple moor grass and rush pasture.

Small woodlands with a variety of characteristics, small traditional orchards and areas of wood pasture are scattered through the landscape, with the largest area extending north from Stanley Wood.

Other less frequent habitats include patches of dry acid grassland, upland hay meadow and good quality semi-improved grassland.

3.1.2 Habitats Known to Occur Where Construction is Proposed

The following section describes broad habitat types thought to occur in each of the areas where construction will occur using online priority habitat inventories and aerial photography. No assessment of the composition and importance of such habitats can be undertaken without a site visit. This section does not discuss sections of the proposal within designated sites as these have already been described in Section 2.

Land around the River Irt Crossing

The route will be situated between land classed as floodplain grazing marsh either side of the River Irt crossing. Aerial mapping suggests this may be a mixture of arable and pasture of varying character separated from the track by a hedgerow.

Ravenglass to the River Esk

South of Ravenglass, path improvement works will be undertaken through mixed, mainly deciduous, woodland, wood pasture and parkland and adjacent to conifer plantation.

The route option that uses the northernmost railway crossing is situated in close proximity to or through an area that has no main habitat type but does encompass patches of reed bed, saltmarsh and mudflats

It also passes through fields that are classed as good quality semi-improved grassland before reaching the Drigg Coast SAC/SSSI at the River Esk Crossing.

The alternative route using the southernmost railway crossing option would not pass through any priority habitats mapped on national inventories north of the River Esk. The land appears from aerial mapping to comprise pasture with trees and unmanaged habitats along the railway embankment.

A595 South of Bootle

Aerial photography of the A595 South of Bootle shows hardstanding, hedgerows and trees, pasture and buildings to be present. Broadleaved woodland is situated east of the main road. The route alignment and therefore habitats through which it passes have not been confirmed. The River Annas, Broomhill Beck and another tributary cross, or are situated in close proximity to this section of road in four locations.

Through Black Combe

The section of route from the A595 through Black Combe will be situated in close proximity to several small traditional orchards and a deciduous woodland, along the edge of an area of upland heath and through grass moorland. These are all priority habitat types. It will also cross at least three streams. Aerial photography show the A595 road verges to comprise grassland with a hedgerow separating it from pasture.

A595 around Whicham

Aerial photography shows hedgerows in close proximity to the road with agricultural fields with side.

The Hill

The cut-through at The Hill is surrounded by residential properties with buildings and associated infrastructure and gardens.

Adjacent to Millom Marsh

The track is situated within an area mapped as coastal and floodplain grazing marsh and adjacent to an area of possible lowland wet meadow. Aerial photography indicates that the track is separated from the pastures and meadow to the west by a hedgerow with standard trees. The verge between the track and the railway appears to be mixed with some areas of grassland and areas of scattered trees and shrubs. At the north of this section, where the route leaves the main track and follows the line of the railway, it appears to run through pasture, scattered trees and past a copse.

A595 near Stanley Wood/Duddon Bridge

Aerial mapping suggests that sections of hedgerow may be present between the road and adjacent fields. Further north, for the alternative route suggested in Section 2, the woodland is present to the western edge of the road. To the east, hedgerows and fields are present. Towards Duddon Bridge buildings and hard standing are situated in close proximity to the road. All fields east of the road are mapped as coastal and floodplain grazing marsh, the woodland to the west has previously been described in the Stanley Wood and Duddon Bridge CWS summary as ancient woodland.

3.1.3 Notable plant species

Cumbria Biodiversity Data Centre provided records of twelve species that are rare or scarce nationally. Most of these are associated with saltmarsh (such as lax flowered sea lavender, glassworts *Salicornia* sp., saltmarsh threadmoss *Bryum salinum*) or dunes (such as sticky storks bill *Erodium lebelii*, variegated horsetail *Equisetum variegatum* and coralroot orchid *Corallorhiza trifida*). A nationally scarce spleenwort *Asplenium obovatum* subsp. *Lanceolatum* and Jacobs ladder *Polemonium caeruleum* were also recorded.

Four species protected by their inclusion on the list of species of principal importance were also provided, the mosses *Bryum marratii* and saltmarsh threadmoss, field gentian *Gentianella campestris* and juniper *Juniperus communis*.

Records of three non-native species listed on Schedule 9 of the Wildlife and Countryside Act were identified by the data search. Himalayan balsam *Impatiens glandulifera* is present on the River Irt upstream of the proposed crossing. A number of stands of Japanese knotweed *Fallopia japonica* are present, in particular, stands of knotweed have been recorded adjacent to the A595 in Stanley Wood and Duddon Bridge (At SD 1974 8816 and SD 196 879). Rhododendron has been noted in the designated sites of Duddon Valley Woodland and Duddon Mosses.

3.2 Likely Impacts

As no habitat survey has been conducted habitats will be present that are not discussed in this section. The full condition and species composition of habitats that are listed are unknown and their importance cannot be fully assessed. A preliminary assessment of likely impacts has been made but should not be considered comprehensive. Again it should be noted that this discussion excludes those areas covered by nature conservation designations.

Land around the River Irt Crossing

Bridge construction is likely to cause the permanent loss of a small area of priority habitat (coastal and floodplain grazing marsh) and temporary disturbance to a greater area during construction.

The exact location of the bridge and access/works have not been confirmed and no habitat survey has been conducted. Therefore the significance of this impact cannot be assessed. If the habitat lost is typical of the surrounding habitat and the land disturbed is managed so that it can re-establish, this is unlikely to be a significant impact. A survey will be needed to determine whether this is the case and to advise on the location of works to avoid any notable areas of habitat.

Ravenglass to the River Esk

Path improvement works through woodland may have the potential to cause damage to trees or root systems. The importance of the trees and likelihood of impacts on them cannot be determined without a site survey.

To the west of the railway small areas of priority habitats could be affected on the boundary of the Drigg Coast SSSI if the northernmost railway crossing were used. The significance of this has been discussed in Section 2.

Where the path passes through good quality semi-improved grassland, some habitat loss can be anticipated, but the extent is not known as the exact alignment of the route has not been determined. Although the railway embankment has been excluded from this classification, this would need to be verified by a site visit. This is not a large area of good quality grassland, and this is not a significant component of the landscape across the route. A habitat survey should be conducted to more accurately determine what the importance of and impacts on this habitat would be.

Consideration should be given to using the alternative route proposed on the east of the railway which would avoid this potentially important grassland.

Road verges

Where the route is to be situated along, but segregated from main roads, the alignment of the route has not been confirmed. In each instance there may be a need to remove sections of hedgerow and trees, either to make room for the path in the verge, to allow the path to enter adjacent fields or to provide sufficient sightlines for road crossings. There is also likely to be a loss of grassland habitats in the verges or adjacent fields. The characteristics of these habitats and thus their ecological importance are unknown and so the significance of these impacts cannot be assessed at the current

time. The removal of long sections of hedgerow or species-rich grassland would be negative impacts of the proposal although the significance cannot be determined without further survey.

In the case of the section south of Bootle, watercourses must also be negotiated. It is not known whether there is currently sufficient width for a path to be created within the existing infrastructure or whether additional engineering will be required. Watercourses are generally considered to be important habitats at a local or greater level. Work to or within a watercourse which is not conducted in a sympathetic manner can cause damage directly and through run off causing siltation or pollution events. These impacts can be readily avoided through adherence to best practice during construction.

Construction within the west verge of the A595 by Duddon Bridge has already been discussed in Section 2 as it may affect the Duddon Bridge and Stanley Wood CWS.

A habitat assessment will be required for each of these sections to determine the most appropriate alignment to minimise ecological impacts. These sections would be unlikely to pose a barrier to route creation, but if important habitats are identified could add to survey and or mitigation costs.

Through Black Combe

Impacts would be considered unlikely to the woodlands and orchards adjacent to the proposal, although if important trees were located in close proximity to the works they may require protection.

The upland heath and grass moorland are priority habitats and therefore have protection through the planning process and are ecologically important.

The proportion of the overall area of habitat that will be affected by the proposal is considered to be negligible. As such the ecological impact of any habitat loss would not be considered to be significant, however, this must be confirmed by a habitat assessment to ensure the habitat on the path edge is not significantly different from the rest of the moorland in its species or structural composition which could make it of greater importance.

Four stream crossings must be negotiated. As previously discussed, rivers are ecologically important and sensitive habitats that can be negatively affected by construction directly and through siltation or pollution events. These impacts can be readily avoided through adherence to best practice during construction.

The Hill

The habitats adjacent to the path through The Hill are not anticipated to be important and the impacts are not considered likely to be significant, although this must be confirmed by a habitat assessment.

Adjacent to Millom Marsh

Construction will be mainly limited to an existing track way and therefore impacts on habitats would be considered minimal, however, notable species can occur in ephemeral and short perennial habitats on vegetated track ways and the importance of habitats must be confirmed by a site visit and habitat assessment. The route may be situated in close proximity to trees, particularly at the northern end of this section. As such, if these were important specimens, protection measures may be required.

Invasive and notable species

Notable species identified by the data search are primarily associated with sand dunes and saltmarsh, habitats that would not be affected outside designated sites. The character of habitats along the route is not known and habitats could support notable species.

Invasive species that could be spread by the proposed works may also be present along the route. A habitat assessment will be required to determine the presence/likely presence of notable and invasive plant species

3.3 Conclusions

As no habitat survey has been conducted this assessment of the impacts of the proposal is at a very preliminary stage and provisional upon the findings of further surveys and confirmation of construction details (e.g. exact route alignment, location of storage areas, access points and works footprint).

Outside the designated nature conservation sites the main potential impacts of the proposal that can be identified on habitats at this stage are to watercourses and the good quality semi-improved grassland just north of the River Esk crossing. Other potentially significant impacts that could be anticipated are the removal of sections of hedgerow, loss of grassland in road verges and damage to scattered or woodland trees located in close proximity to the route. Grass moorland and upland heath will be affected through Black Combe, but as only a very small proportion of habitat would be affected this impact is unlikely to be significant.

Invasive species, notable flora and important habitats could be present throughout the landscape and before any definite conclusions can be reached, a habitat assessment based on a survey of the site will be required. If the loss of potentially notable habitats or species cannot be avoided detailed botanical surveys could be required.

No habitats have been identified outside designated nature conservation sites that would be a barrier to route development, but habitats could be identified by a field survey that could pose a constraint. It is considered unlikely that a habitat constraint will be identified by the field survey that would prevent the development of this route altogether, but it could pose restrictions on the exact alignment or require survey and/or mitigation with an associated cost.

3.4 Recommendations

- A habitat assessment such as a Phase 1 Habitat Survey must be undertaken of the proposed route. This will inform the need for botanical surveys, the detailed route design and any need for mitigation/compensation measures.
- Consideration should be given to locating the route on the east side of the railway to the immediate north of the River Esk crossing if habitat impacts are considered to be significant (based on a site visit).
- The detailed design should include elements of habitat enhancement where this can feasibly be designed into the scheme. The habitat survey and consultation with local nature conservation organisations can inform opportunities.
- Adhere to Pollution Prevention Guidelines and other best practice guidance for working near water.

4 Fauna

4.1 Invertebrates

4.1.1 Baseline Information

The proposed route passes through a landscape rich in invertebrates and contains a number of important sites for invertebrate conservation.

Duddon Estuary SSSI is described as being important for its invertebrate population which includes a number of rare and nationally scarce species discussed in Section 2. The Drigg Coast SAC contains or overlaps with two Site of Invertebrate Significance (SIS): Ravenglass SIS and Eskmeals Dunes SIS. Black Combe also contains a SIS situated 650 m from the proposed path. Muncaster Wood CWS (located 930m from the proposed route) also contains a SIS.

One invertebrate species protected under Schedule 5 of the Wildlife and Countryside Act against killing and injury was identified in the data search, although the species had been redacted due to the sensitive nature of the record. This was known from a single record at the River Irt from 1995.

Records of seventy-six nationally notable, rare or scarce invertebrate species were provided by the data search; three true bug species, four true fly species, the small periwinkle *Melarhaphe neritoides* and sixty eight beetle species.

Records of twenty-two species that are afforded protection under the NERC 2006 Act were also provided. These were the aforementioned sensitive species, the northern dune tiger beetle *Cicindela hybrid* (in Drigg Dunes), black oil beetle *Meloe proscarabaeus* (near Bootle and Middleton Place), common oyster *Ostrea edulis* (around Drigg and Eskmeal) and a variety of butterfly and moth species. The butterfly and moth records were from a variety of locations but with the majority of records from Millom Ironworks, Eskmeal Dunes and Drigg Dunes.

4.1.2 Likely Impacts

The proposed construction work has potential to affect estuarine and saltmarsh habitats and their associated invertebrate communities where new bridges are proposed over the River Irt and potentially the River Esk, as discussed in Section 2. The protection of notable invertebrates, including the Schedule 5 species, and their habitats is an important element of the scheme design in this location.

The section of new path construction to the north of the River Esk crossing may impact habitats that could be important for invertebrates, railway embankment, reed bed, saltmarsh, mudflats and good quality semi-improved grassland (as identified in Section 3 from habitat inventories).

The majority of the route follows existing roads, tracks and pathways. The paths would be unlikely to be important habitats for invertebrate but the verges could be important and significantly different from adjacent habitats. In some cases existing paths would need to be widened. In the locations where a segregated path is proposed adjacent to a main road, no information is known regarding the habitat characteristics or their value to invertebrates. Without a site visit, no assessment of the potential impacts on some notable or protected invertebrate species can be made.

River crossings are likely to be required in other locations (through Black Combe and potentially in the road verge south of Bootle). Aquatic invertebrates can be sensitive to pollution and siltation events resulting from poorly controlled construction. It is anticipated that these can be readily avoided through sympathetic crossing design and adherence to construction best practice methods.

Consideration should be given to whether good quality invertebrate habitats can be created along the route as part of the scheme to provide ecological enhancements. The potential for, and value of, enhancements for invertebrates can be determined by the site assessment.

4.1.3 Conclusions

Notable and protected aquatic and saltmarsh invertebrates could be impacted by the proposed bridges over the River Irt and Esk, including a species protected against killing and injury under Schedule 5 of the Wildlife and Countryside Act (1981). Other aquatic invertebrates could be affected by bridge construction elsewhere along the route. It is anticipated that sympathetic design and responsible construction methods will minimise impacts on invertebrates and their habitats.

The construction of a new path west of the railway to the north of the River Esk may affect habitats that are important for invertebrates or that support protected or notable invertebrates. No detailed information is known about the habitats that would be affected by the widening of existing paths and tracks and the creation of segregated routes alongside main roads. As such impacts on invertebrates in these locations cannot be assessed without a site visit.

Consideration should be given to whether good quality invertebrate habitats can be created along the route as part of the scheme to provide ecological enhancements.

4.1.4 Recommendations

- The detailed design of all river crossings, particularly the River Irt and River Esk, must protect important invertebrate habitats.
- A field survey is required to clarify how important habitats might be to invertebrates, particularly the section west of the railway to the north of the River Esk Crossing but also any verges that will be lost or reduced by path construction. This will determine what the impact of the proposal on invertebrates might be and should also seek to provide advice on enhancement measures for invertebrates. If high value invertebrate habitats are to be affected, targeted surveys and mitigation may be required.
- Adhere to pollution prevention guidelines and other best practice guidance for working near water.
- The Schedule 5 species should be identified and risk of killing/injuring this species during works assessed.

4.2 Amphibians

4.2.1 Baseline Information

Records of five amphibian species were provided by the local record centre; common toad *Bufo bufo*, natterjack toad, common frog *Rana temporaria*, smooth newt *Lissotriton vulgaris*, palmate newt *L. helveticus* and great crested newt *Triturus cristatus*.

Natterjack toad and great crested newt are European Protected Species and important populations are present in the area.

The Duddon and Esk Estuaries contain two of the five most important natterjack toad populations nationally, Duddon Estuary alone supports 18 – 25% of the UK population. Although located relatively evenly through the estuary, particular concentrations occur at the southeast of the estuary and in Millom Ironworks. Millom Marsh CWS is noted to support foraging and hibernating natterjack toads and a number of breeding ponds are known from the area around both estuaries. Records of this species are focussed around these two estuaries although records are present in other locations, for example around Stangrah, approximately midway between the two. This species is a habitat specialist but can travel relatively long distances from breeding ponds.

One of the qualifying criteria for the Duddon Estuary SAC is its great crested newt population, although it should be noted that no great crested newt records were provided within 1km of the route around the estuary. This species is also noted in the Drigg Coast SSSI designation and the

majority of the records provided were from the Drigg and Eskmeals area, with a single record also provided from Wetherby. This species is less specific in its habitat requirements and could be present along the proposed route wherever there are ponds situated within 500m. Great crested newts are most likely to be present where ponds are situated within 250m of the route.

The other, more common, amphibian species are also highly likely to be present in habitats along the entire length of the route. They have been recorded in the same areas as the natterjack toads (likely due to the increased survey effort in these locations) and records are also scattered across the remainder of the landscape.

4.2.2 Likely Impacts

No ponds will be lost and no construction work is located in close proximity to known ponds that could result in accidental damage through poor construction protocol. The proposal will not result in a loss of a significant proportion of foraging habitat, nor will it fragment habitats for amphibians as the path is not considered to be a barrier to amphibian movement.

Amphibians could be at risk of injury or killing from construction work, depending on the habitats to be affected. In the case of great crested newt and natterjack toad, this would be in contravention of current legislation and development licences are likely to be required.

In the long-term, consideration must also be given to whether the proposal would increase the risk of mortality to common and natterjack toads during migration. It is anticipated that where the route follows existing well used roads, the risk to toads would not be significantly increased by the designation of the cycle route. On private or very quiet roads and newly constructed sections of path located on migration routes there may be a risk of increased risk of mortality from bicycles and trampling.

Whilst these are significant considerations of the proposal and the survey and mitigation work will add additional costs to the proposal it is not anticipated that the presence of notable protected amphibian populations would be a barrier to route development.

Where existing infrastructure currently has a high toad mortality rate (e.g. through the presence of inappropriate kerbs and gully pots), modifications could be designed in as part of this scheme as an ecological enhancement.

4.2.3 Conclusions

No reduction or fragmentation of habitat for amphibians would be anticipated from this project, however;

- Amphibians, including great crested newts and natterjack toads, could be at risk of harm from construction work if appropriate mitigation measures are not taken; and,
- Common and natterjack toads could be at risk of mortality from pedestrians and cyclists if the route crossed migration routes and was not sympathetically designed.

Neither issue would form a barrier to the proposal but would require measures to avoid or mitigate the impacts. Mitigation measures are likely to require a development licence.

If existing infrastructure could be modified in areas known to have a high toad mortality rate, this would be an ecological enhancement of the proposal.

4.2.4 Recommendations

- A great crested newt assessment must be conducted to determine whether a great crested newt survey is required for some sections of the route. This assessment will consider the likelihood of this species being present in habitats that will be affected by construction (based on the proximity and potential suitability of ponds, the extent of surrounding foraging

habitat, the presence of barriers to movement between ponds and construction; and the suitability of habitat to be affected by the works). Where a risk of an offence occurring is identified, a survey will need to be undertaken to determine whether this species is present. Where great crested newts are present and there is a risk of harm from construction, a mitigation strategy to minimise this risk will be required.

- An assessment must be conducted to determine locations where work could result in harm to natterjack toads during construction. Where these toads are present a mitigation strategy to minimise this risk will be required.
- Further study is required to determine whether toad migration points are present along the route or high risk locations. This is likely to comprise a combination of desk-based assessment, consultation and survey work where appropriate. In high risk locations measures to reduce mortality risk will be required. Measures should be proportional to the risk in each location and could include engineering solutions (e.g. creating toad-underpasses) and/or signage.
- Consider including modifications to existing infrastructure if it is currently known to have a high mortality rate (e.g. through the presence of inappropriate kerbs and gully pots), as an ecological enhancement.

4.3 Birds

4.3.1 Baseline Information

As discussed in Section 2 Duddon Estuary SPA is internationally important for Annex I bird species. The site regularly supports over 78,000 waterfowl in winter and supports internationally important populations of overwintering and passage bird species (as discussed in Section 2).

The data search provided records of 46 bird species with additional protection through their inclusion on Schedule 1 of the Wildlife and Countryside Act. The identity of 20 of these is unknown as they are sensitive species. The remainder are primarily water birds and waders (some of which are seasonal visitors to this area only) with some rarities or occasional visitors, winter thrushes and kingfisher *Alcedo atthis*.

A large variety of different habitats are present along the route, most of which could be used by foraging, nesting and roosting birds. Habitats of particular note for nesting birds along this route are; woodland and hedgerows, moorland, marshes and fens, riverbanks and structures, although bird will nest in a huge variety of places and can be anticipated in most habitats.

The coastal and floodplain grazing marshes and intertidal habitats are particularly important for foraging birds (especially around Duddon Estuary – as indicated by its SPA designation). The SSSI designation for the Duddon estuary notes that high tide roosts that are of particular importance to wildfowl and waders are mainly further south in the estuary, but include Millom Marsh and Greetygate Marsh located closer to the proposed route. It also notes that low tide feeding areas are less well defined and vary depending on the changing pattern of channels and wet sand.

4.3.2 Likely Impacts

It is likely that small amounts of habitat that could be used by nesting birds will be removed. Path construction will be mainly be situated on existing tracks and footpaths, however, vegetation clearance may be required if existing paths need to be widened. There will also be new path creation through mixed habitats to the west of the railway north of the River Esk crossing. The quantity of nesting habitat to be removed is not considered significant and would not affect the amount of nesting habitat available locally.

Ground nesting birds can be vulnerable to disturbance from dogs. Marshes, wetlands and moorland are significant habitats for ground nesting birds. No areas of undisturbed land will be opened up for

public access by this proposal, and so nesting habitats along the route are likely to already be affected to some extent by dog walkers. It is not anticipated that the proposed route creation will lead to a significant increase in the number of dog walkers using the paths and causing disturbance to ground nesting birds, but further consideration may be required in relation to this impact.

All bird species are protected whilst nesting. If habitat suitable for nesting birds is removed during the breeding season the work could result in disturbance to nesting birds in contravention of current legislation. Work is also proposed at watercourses. If banks are appropriate for nesting kingfisher or birds nest in existing structures, they could also be disturbed by construction in the breeding season. Disturbance to nesting birds can readily be avoided through the timing of works.

Consideration must be given to whether the increased access would disturb birds foraging or roosting on the foreshore, particularly around high tide foraging and roosting areas such as Millom Marsh. The likelihood that these birds would be disturbed by increased traffic on the adjacent path will depend on the usual distribution of birds in that marsh and the presence of screening vegetation along the railway. Aerial photography shows that some vegetation is present between the proposed route and the railway which would screen wildlife from path users, but this may not be continuous across the whole length of the path. The extent of screening vegetation will need to be determined from the field survey.

4.3.3 Conclusions

The route will be situated in close proximity to one known area of importance to foraging and roosting birds; Millom Marsh. The likelihood that these birds would be disturbed by increased traffic on the adjacent path will depend on the usual distribution of birds in that marsh and the presence of screening vegetation along the railway. Given the international importance of the wader and wildfowl populations around this estuary, this impact will need to be considered in more detail and avoided or mitigated.

Nesting habitat will be cleared along the whole route and has potential to disturb nesting birds if conducted during breeding season but would be unlikely to have a long-term impact on breeding bird populations. Disturbance could also result from construction at the watercourses if banks or structures are used by nesting birds. It is anticipated that disturbance to birds can be readily avoided by appropriate timing of works.

4.3.4 Recommendations

- Further assessment of the likelihood of disturbance to birds in Millom Marsh will be required. A site visit will determine the extent of screening vegetation between the route and the marsh. This will determine whether this could be a significant impact of the proposal. If screening vegetation is not sufficient to rule out this impact, further consultation, detailed surveys and/or measures to avoid/mitigate such an impacts would be required.
- Clearance of nesting habitat must be undertaken outside the peak bird nesting season or be preceded by a nesting bird check by a suitably experienced ecologist. If banks and structures are suitable for use by nesting birds, work in these areas should also be undertaken outside the peak breeding season or be subject to nesting bird checks. The peak nesting season is generally considered to be March to September inclusive but is weather dependent.
- It is not anticipated that the proposed route creation will lead to a significant increase in the number of dog walkers using the paths and causing disturbance to ground nesting birds, but further consideration may be required in relation to this impact.

4.4 Fish

4.4.1 Baseline Information

A large variety of fish species will be present in the rivers and estuaries. Records of only one fish species were provided by the data search; Atlantic salmon *Salma salar*. This is a species of principal importance listed in the NERC Act (2006).

The Rivers Esk, Irt and Mite are likely to support important fish populations including of Atlantic salmon. It is not known whether the streams through Black Combe or alongside the A595 through Bootle are important for fish populations. mpacts Anticipated

4.4.2 Likely Impacts

Fish populations could be impacted by the proposed bridges over the River Irt and Esk, and possibly in smaller streams in Black Combe and South of Bootle, if they are not designed and constructed in a sympathetic manner.

If bridges over the smaller watercourses are not sympathetically designed they could impede fish movement. Inappropriate bridge design could also cause scour, increased siltation and habitat loss and may therefore have potential to affect fish populations. This would depend on the detailed design of the scheme and could be readily avoided through using free spanning bridges or other sympathetic designs.

Impacts during construction can likely be avoided through adherence to Pollution Prevention Guidelines and other best practice guidance for working in/near water.

4.4.3 Conclusions

Fish populations could be impacted by the proposed bridges over the River Irt and Esk, and possibly in smaller streams in Black Combe and South of Bootle, if they are not designed and constructed in a sympathetic manner. It is anticipated that appropriate design and responsible construction methods will minimise impacts on fish populations.

4.4.4 Recommendations

- All bridges proposed should be designed to minimise ecological impacts; to avoid scour, habitat loss and allow continued natural movements of fish along the watercourse.
- During construction, adhere to pollution prevention guidelines and other best practice guidance for working in/near water.

4.5 Mammals

4.5.1 Baseline Information

Records of four marine mammal species were provided by the data search including records of grey seal *Halichoerus grypus*, common seal *Phoca vitulina* and common porpoise *Phocoena phocoena* in the estuaries and around existing viaducts. For the seal records it is not specified whether individuals were in the water or using the terrestrial habitats along the shore.

Records of twenty-three terrestrial mammal species were identified including twelve with statutory protection.

- Badger *Meles meles* are present throughout the landscape. Suitable locations for setts, such as woodland, hedgerows and embankments are situated in close proximity to the route, particularly where the route is adjacent to the railway and through Duddon Bridge and Stanley Wood.
- Otter should be considered to be present in all watercourses and in the estuaries.

- Red squirrel *Scurius vulgaris* are present throughout the landscape.
- Dormouse *Muscardinus avellana* have been recorded four times in the area between 1993 and 2001 around Duddon Bridge and could be present in this and other woodlands and associated hedgerows.
- Eight bat species have been recorded within 1km of the route; Noctule *Nyctalus noctula*, brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis natterii*, whiskered bat *Myotis mystacinus* and Brandts bat *Myotis brandtii*. These species are all widespread in the county but vary in their status. Bat roosts could be present in trees and structures along the route but have not been identified by the data search.

Records of various other terrestrial mammal species were provided including three species which have protection through the planning process though inclusion in the list of Species of Principal Importance in the NERC (2006) Act; hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus* and polecat *Mustela putorius*. Also of note is the presence of water shrew *Neomys fodiens* in the Drigg area.

The lack of records is not evidence that a species is absent from an area as many species are under-recorded. No records were provided for water vole *Arvicola terrestris* and this species has undergone a massive recent decline. It is considered unlikely that this species is present, but given its status and legal protection, a precautionary approach should be taken. The large rivers along the route on the Drigg Coast are unlikely to be suitable for this species at the location of the river crossings due to their size and estuarine influences. Smaller watercourses such as those through Black Combe and beside the River Irt Crossing may be suitable for this species. This cannot be confirmed without a site visit.

4.5.2 Likely Impacts

Badger

The proposal will not result in significant reduction or fragmentation of available foraging habitat for badgers. Construction conducted in close proximity to a sett could result in disturbance or damage to that sett in contravention of current wildlife legislation.

The impact that the presence of badger setts would have on the proposal will depend on the exact location and situation of each sett and its status (i.e. whether it is a main sett). Sympathetic construction methods or route diversions may avoid disturbance or damage. If damage cannot be avoided temporary or permanent closure of setts may be required under Natural England licence.

It is unlikely that the presence of badger setts would be a barrier to route development but there would be an additional cost associated with the any survey and/or mitigation work required.

Bats

The proposed route creation is not anticipated to result in significant habitat loss for foraging bats. No lighting is proposed that might affect foraging behaviour of light sensitive species. No impacts are therefore anticipated on foraging behaviour of bats.

If hedgerow removal is required to allow path construction in road verges or at road junctions or crossings, an assessment will be required to determine whether this might disrupt the commuting routes of bat species that rely on such features, such as brown long eared bats. This will depend on the location and characteristics of the hedgerow and surrounding habitats and on the length of hedgerow to be lost. If the hedgerow removal is deemed to have a significant effect on bats, measures would be necessary to avoid or mitigate that impact.

Route construction may require the removal of trees, particularly through Duddon Bridge and Stanley Wood, which could contain features suitable for roosting bats. As the proposed path is situated on the line of an existing track, it may be that no tree removal would be needed, however, the width and state of the track are unknown at the time of writing. It is similarly unclear whether the route can be

sympathetically designed to retain and protect any potential roosting features as the steep gradients in the woodland may prevent this. If bat roosts would be destroyed an alternative route using the verges of the A595 should be considered. If potential roosting features cannot be protected throughout the development further bat surveys and, if bats are present, appropriate mitigation would be required under a Natural England licence.

Any work to structures has potential to destroy/damage/disturb roosts if present. Possible work to an existing structure is anticipated over the River Esk and recommended over the River Mite. This work will need to be preceded by appropriate bat survey to determine the presence/absence of bats. Depending on the location and type of roost, impacts could be avoided through sympathetic design/construction.

Should bats be present, and impacts cannot be avoided, it is unlikely that this would halt development, but costs of survey and avoidance/mitigation measures would vary dependent on the roost type.

Construction of new structures or adaptation of existing structures (e.g. over the Rivers Irt and Esk) offer the opportunity to provide high quality bat roosting habitat by designing in appropriate features into the structure as an ecological enhancement for the project. The value of this enhancement and the species which this should target may very dependent on the exact location of the structure.

Dormouse

Construction will be located through dormouse habitat in Duddon Bridge and Stanley Wood. Without a site assessment the impact of construction on dormouse habitat cannot be determined. As the proposed path is situated on the line of an existing track, habitat loss is anticipated to be limited, but dependent on the habitat to be disturbed, construction has potential to harm dormice. It is anticipated that this risk can be minimised by working at the appropriate time of year and using sympathetic construction methods.

Hedgerow removal may be required elsewhere along the route, for example where the route is proposed in road verges or around road crossings and junctions to provide sufficient line of sights. An assessment of the suitability of these hedgerows to support dormice will be required which will take into account the characteristics of the hedgerow and its connectivity with other suitable habitat. Where hedgerow removal would cause a significant loss of habitat for dormouse or fragment habitat, surveys and/or measures to avoid or mitigate the impacts would be required.

The presence of this species would not be likely to be a barrier to route development but may affect the timing and methodology of construction through Duddon Bridge and Stanley Woodland. If potentially important sections of hedgerow were to be removed, survey and potentially mitigation under licence would be required with associated cost implications.

Marine mammals

No additional disturbance is anticipated to seals resting on the banks of the rivers from route construction as the crossing points are already subject to disturbance from public footpaths. The proposed bridges over the Rivers Irt and Esk are considered unlikely to form a barrier to the movement of marine mammals or significantly affect the availability of food.

Otter

The construction of a surfaced path would not be anticipated to fragment or reduce otter foraging habitat. Bridge construction over the main rivers and the small streams around Black Combe would be unlikely to hinder otter movement through the landscape. Otters are resilient to human disturbance and impacts are only anticipated to occur if construction is carried out in close proximity to a breeding holt.

Holts are generally to be found within 500m of watercourses, although are usually closer, therefore the locations where construction would be most likely to encounter a holt would be around the

crossings of the Rivers Irt and Esk, although this would depend on the availability of suitable features in those locations.

A field survey of the route would aim to determine the likelihood of a breeding holt being situated in close proximity to the proposed works. The presence of other holts along the route would not be a barrier to route development but may affect the timing of construction of certain elements of the route.

Red Squirrel

The extent to which tree removal is required is not known but could include locations in Duddon Bridge and Stanley Wood, for bridge construction and site access, where the path is to be situated in road verges or to create appropriate sightlines at road crossings and junctions. It is not anticipated that the expected amount of vegetation removal would cause significant habitat fragmentation for red squirrels although this should be assessed as part of the field survey. Squirrel dreys could be present in trees to be removed. All affected trees would need to be checked for dreys prior to removal and if present mitigation and appropriate timing of works will be required.

Water Vole

Proposed construction will cross or be situated in close proximity to smaller watercourses through Black Combe and beside the River Irt Crossing. If this species were present construction in these locations construction may have potential to damage burrows. Appropriately designed bridges would be unlikely to be a barrier to water vole dispersal due to the small size of the watercourses but could reduce movement and fragment territories.

As discussed in Section 4.5.1 it is considered unlikely that this species is present along the route, however a precautionary approach should be taken due to their rarity and legal protection. A habitat survey will determine whether watercourses within 5m of the construction footprint would provide suitable habitat for this species.

It is anticipated that impacts on this species (if present) would be minor as the lengths of water course to be affected would be very short, but further specific surveys may be required to determine presence/absence.

It is unlikely that the presence of water vole would be a barrier to route development but there would be an additional cost associated with the any additional survey and/or mitigation work required.

Other Species

Other mammal species such as hedgehog, brown hare and polecat are unlikely to be affected by the proposal. No large scale habitat loss will occur that would have impacts on the population status of other mammal species in the local area. The path is also unlikely to form a barrier to mammal movements.

Consideration should be given in bridge design to ensure the structures do not form a barrier to the movement of species such as water vole or water shrew along the river corridors even if they are not currently present.

4.5.3 Conclusions

Various mammal species are likely to be present along the route, some of which could be affected by the proposal. The proposal is not anticipated to result in significant habitat loss for any mammal species except if hedgerow removal were required that was important for bats, dormice or red squirrel. Construction has the potential to harm individuals of certain species or their resting places which may require mitigation under a development licence.

Possible impacts on mammal species are summarised below;

- Badgers are present throughout the landscape and setts could be present near proposed construction areas, particularly around the railway embankment and woodlands.

Construction near setts could cause damage or disturbance in contravention of current legislation.

- Eight bat species are known to be present in the area. Bats could be affected if trees with roosts are to be removed, structures with roosts were affected or significant sections of hedgerow used by certain bat species were to be removed.
- Dormice have been recorded around Duddon Bridge and may be present here, in Stanley Wood and in hedgerows with high connectivity to sufficient dormouse habitat. There is a risk that dormice could be harmed if construction in suitable sections of habitat is not conducted in a sympathetic manner. Hedgerow removal also has potential to destroy and fragment dormouse habitat if used by this species.
- Otters are present in the area, have large ranges and are likely to use all watercourses along the route. Impacts on otter are considered unlikely unless construction were proposed in close proximity to a holt. Holts would be considered most likely to be present near the large river crossings.
- Red squirrel dreys could be present in trees and individual squirrels may be harmed if these trees are removed at the wrong time of year. It is considered unlikely that the removal of trees and hedgerows would fragment red squirrel habitat, but this must be assessed once the scheme design is confirmed.
- Water vole are considered unlikely to be present, but if they were present in small watercourses beside the River Irt crossing or over streams in Black Coombe, damage to burrows and some habitat fragmentation could occur. Given their rarity and legal protection of this species, a precautionary approach must be taken in relation to these watercourses.

Other mammal species are likely to be present, but no impacts would be anticipated on them from the proposal. It is anticipated that alterations to the detailed scheme design could avoid or mitigate most of the identified impacts on mammals and that their presence would not form a barrier to constructions, although any additional surveys and mitigation resulting from the presence of these species would add to the overall cost of the proposal.

4.5.4 Recommendations

A site survey will need to determine;

- The presence of badger setts;
- The presence of features that could be used by roosting bats and likelihood of impacts on them;
- The likelihood of dormouse being present and impacts upon them;
- The likelihood of otter holts being present in close proximity to construction work;
- The likelihood that red squirrel habitat would be fragmented; and,
- The suitability of any watercourses that cannot be protected by an appropriate buffer zone for water vole (this should be taken as 5m from the toe of the bank until detailed construction methods are known).

This assessment may identify the need for more detailed presence/absence surveys if impacts cannot be avoided. The detailed design of the scheme should take the results of these surveys/assessments into consideration to avoid and minimise impacts on these species wherever possible.

4.6 Reptiles

4.6.1 Baseline Information

The data search identified records of three reptile species within 1km of the route; adder *Vipera berus*, slow worm *Anguis fragilis* and common lizard *Zootoca vivipara*. These records are concentrated around the Drigg to Eskmeal area but are also present around Silecroft, Millom, the Hill and Hallthwaites.

The three reptile species identified by the desk study could potentially occur in suitable habitats anywhere along the entire route. It is anticipated that Black Combe, habitat along the railway embankment and coastal margins are all likely to support reptiles. Road verges, field margins and woodland rides could also have habitat suitable for reptiles.

4.6.2 Likely Impacts

Path construction is unlikely to result in a significant loss of foraging habitat for reptiles. The new surfaced path would be unlikely to fragment reptile habitat unless they were dependent upon a narrow verge of habitat for movement which were to be lost. There may be a risk that reptiles could be harmed or hibernacula damaged during construction work in suitable habitats.

The risk of these impacts occurring can only be determined from a field survey that assesses the suitability of habitat in the works footprint and adjacent habitats. It is anticipated that harm to reptiles can be avoided through sympathetic detailed design and construction methods. In the unlikely event that fragmentation of reptile habitat is anticipated, a presence/absence survey for reptiles and/or mitigation measures may be required.

The presence/likely presence of reptiles would not form a barrier to this project, but where additional surveys or measures to reduce the risk to reptiles are required, there would be an associated cost.

There is the opportunity for some habitat creation for reptiles as an enhancement for the project. Artificial hibernacula can be created in adjacent habitats and additional vegetation clearance could be undertaken in overgrown areas to create a more structurally varied habitat. The field survey will determine what the suitability and value of such measures would be.

4.6.3 Conclusions

Adder, slow worm and common lizard are present, particularly in the Drigg to Eskmeal area and could occur in suitable habitats anywhere along the entire route.

There is a risk that construction in suitable reptile habitat could result in harm to reptiles and loss of hibernacula. Path construction is unlikely to result in habitat loss or fragmentation unless they were dependent upon a narrow verge of habitat for movement which were to be lost. The risk of these impacts occurring can only be determined from a habitat assessment.

It is anticipated that harm to reptiles can be readily avoided through sympathetic design and construction. In the unlikely event that fragmentation of reptile habitat is anticipated, a presence/absence survey for reptiles may be required.

The presence/likely presence of reptiles would not form a barrier to this project, but where additional surveys or measures to reduce the risk to reptiles are required, there would be an associated cost.

There may be opportunities to provide enhancement measures for reptiles as part of the proposal.

4.6.4 Recommendations

- During the field survey an assessment of the likelihood of habitat fragmentation, harm to reptiles and loss of hibernacula must be made.

- Detailed design should aim to avoid potential hibernacula and habitat fragmentation. If habitat fragmentation is anticipated presence/absence surveys will be required.
- Measures to reduce the risk of reptiles being harmed during construction will be required within suitable reptile habitats.
- Consideration could be given to habitat enhancement measures for reptiles such as creating artificial hibernacula if this is deemed appropriate by the field survey.

5 Summary

5.1 Conclusions

This is a desk based assessment only and therefore the assessment of anticipated ecological impacts in this report is provisional. The majority of the route uses existing quiet roads with no construction required and no significant changes in land use in the long-term.

Construction is proposed in 9 locations. The potential impacts during construction and in the long-term from users of the path have been discussed in relation to nature conservation sites, habitats and species. These are summarised below.

Current planning policy demands that construction projects not only minimise their ecological impact, but provide enhancements wherever possible. Ecological enhancement measures proportional to the scale of the proposal should be built into the detailed design of the scheme.

Drigg to Hall Carleton (The River Irt Crossing)

River crossing situated within the Drigg Coast SSSI and SAC and Lake District National Park;

- Construction of bridge footings will cause minor loss of priority habitat – survey required to determine the best location to minimise the impact of habitat loss.
- In-channel impacts dependent on the design of the bridge. A free spanning bridge will reduce in-channel impacts. Impacts from shading are considered unlikely although this must be confirmed by a marine ecologist due to seagrass habitats in the River Irt area, not noted elsewhere in the SSSI.
- Consideration will need to be given to the long-term impacts on mobile habitats such as sand-dunes located adjacent to the bridge.
- Temporary habitat loss will be associated with the works area and access. Surveys and mitigation required to minimise the impacts and facilitate habitat recovery.
- Natterjack toads, notable invertebrates and reptiles are likely to be present in this section. Nesting birds, otter holts, badger setts and bat roosts could all be present depending on the characteristics of the habitats present in the footprint. Great crested newts could be present if ponds situated within 250m are suitable breeding habitat. Measures to protect these notable and protected species during construction and in the long-term will be required.

Ravenglass to the River Esk

Route situated in the Lake District National Park and within 10m of the Drigg Coast SSSI and SAC boundary in one location;

- Engineering work may be significant in this location and access for machinery may be necessary in the SSSI. Impacts could result from poor construction practice.
- Construction through woodland could damage trees, although scale and significance of impact cannot be determined without further survey work. If significant, this impact could be readily avoided through sympathetic design and construction.
- Habitat loss west of the railway could include small areas of priority habitat. The importance of these, and whether they may form an integral part of the adjacent SSSI/SAC cannot be determined without a site survey.
- An alternate route east of the railway has been proposed to reduce the ecological impacts.

- Notable invertebrates, nesting birds and reptiles are likely to be present in this section. Natterjack toad, badger setts, otter holts, bat roosts, dormice and red squirrel could all be present in this section depending on the characteristics of the habitats present in the footprint. Measures to protect these notable and protected species during construction and in the long-term will be required.

River Esk Crossing

River crossing situated within the Drigg Coast SSSI and SAC and Lake District National Park;

- If the footpath is cantilevered off the existing viaduct, no impacts would be anticipated on the habitats below. However, there may be features for roosting bats and nesting birds in the structure that could be disturbed by works.
- Impacts of constructing a parallel bridge with new footings would depend on bridge design. Construction of bridge footings will cause minor loss of priority habitat. More extensive disturbance of priority habitats would be associated with the works area. Survey required to determine the best location to minimise the impact of habitat loss and reduce and mitigate the temporary disturbance.
- Natterjack toad, notable invertebrates, reptiles, nesting birds, fish, badger setts, otter holts would all need to be considered and protected in the design and construction of a new bridge.

Road verges

Some sections of path construction in road verges will be within the Lake District National Park.

- Impacts on habitats could include the removal of sections of hedgerow, trees and loss of grassland. The quality and importance of these habitat cannot be determined without further survey work. Bats, dormice, red squirrel and nesting birds could all use hedgerows and trees and be impacted by their loss. Dependent on the character and location of these habitats and extent of habitat loss.
- South of Bootle construction may be required over or in close proximity to watercourses in several locations. Rivers are important habitats and could support water voles, notable aquatic invertebrates and fish populations. Poor bridge designs or poorly controlled construction works could negatively impact this habitat and associated species.
- The west verge of the A595 by Duddon Bridge comprises ancient woodland, an important habitat that could be damaged by construction. It also contains Japanese knotweed, an invasive, non-native species that could be spread by construction work.
- Other protected and notable fauna that could be present in the road verges across the route include notable invertebrates, great crested newts, nesting birds, badger setts, and reptiles.

Through Black Combe

Construction through the Lake District National Park.

- Path constriction will result in minor loss of priority habitat (upland heath and grass moorland). Whilst this is not considered likely to be significant, this must be confirmed by a habitat assessment to ensure the habitat on the path edge is not significantly different from the rest of the moorland.
- Notable invertebrates and reptiles are likely to be present and great crested newt, badger setts, and nesting birds could be present.
- Four stream crossings must be negotiated. Rivers are important habitats and could support water voles, notable aquatic invertebrates and fish populations. Poor bridge designs or

poorly controlled construction works could negatively impact this habitat and associated species.

- It is not considered likely that dog walking would increase significantly in this location as a result of the proposal, but further consideration should be given to this question in relation to the potential impacts on ground nesting birds.

The Hill

- Ecological impacts from construction through The Hill are not anticipated to be significant and protected species are considered unlikely to be affected in this section of route, but this must be confirmed by a site visit by an ecologist.

Adjacent to Millom Marsh

- Significant impacts on habitats considered unlikely in this section as construction is situated on an existing track, however, a site survey is required to confirm that notable plant species or tree specimens would not be affected.
- The adjacent Millom Marsh supports an important natterjack toad population and is an important high tide roosting and feeding area. Nesting birds and roosting bats could use adjacent trees. Reptiles, great crested newt and notable invertebrates could also be present in the verges. If present, these will all need to be protected during construction and in the long-term.

Through Duddon Bridge and Stanley Woodland

Construction within a County Wildlife Site;

- Impacts on ancient woodland may result from path improvement works, survey required to determine the extent and significance of impacts. Consideration also needs to be given to the long-term impact of the need for increased tree works along the path for safety reasons.
- Consideration could be given to avoiding this woodland altogether by using the road verges or field edges to the east of the A595.
- Notable invertebrates, badger setts and nesting birds could be present. Consideration should also be given to whether reptiles or great crested newt could be present.

In areas of no Construction

- Where the route crosses toad migration points, consideration will need to be given to whether the increase in recreational use of quiet roads or private tracks will lead to a significantly increased risk of toad mortality.

5.2 Recommendations

Consultation with Natural England, Marine Management Organisation and the Local Planning Authority (LPA) is recommended at the earliest opportunity to discuss the implications and opportunities of route development through the Drigg Coast SSSI and SAC designated site and potential impacts on birds using Millom Marsh and natterjack toads, which relate to the Duddon Estuary SSSI, SAC and SPA.

The LPA should also be consulted in relation to impacts on the Stanley Wood and Duddon Bridge CWS.

Prior to applying for Planning Permission this report should be upgraded to an Ecological Impact Assessment in line with CIEEM Guidelines 2013, or, if required for the sections affecting the SAC/SPA, an Appropriate Assessment. In order to do this the following surveys or assessments are

likely to be required although this is dependent on the exact route and engineering solutions proposed;

- An assessment of the importance of habitats affected by the proposed based on a survey such as a Phase 1 Habitat Survey and detailed botanical surveys in areas of potential botanical importance identified by the Phase 1 habitat survey;
- An assessment of likely long-term impacts on the nearby sand dunes from the construction of bridge foundations at the River Irt Crossing;
- Further assessment of the potential disturbance to birds using Millom Marsh based on a site visit to assess extent of screening vegetation and, if required, consultation and surveys;
- An assessment of the potential for increased mortality risk to migrating natterjack toads from users of the path, likely to be based on consultation, desk based assessment and potentially surveys;
- An assessment of risk to great crested newts and presence/absence surveys where required;
- An assessment of the importance of habitats to be affected by construction for invertebrates and reptiles, with specific surveys where significant impacts are identified;
- An assessment of the importance of hedgerows to be removed for dormice, bats and red squirrels and specific surveys where required ;
- An assessment of the suitability of watercourses located within 5m of the proposed works for water voles, particularly those in Black Combe and in the verge south of Bootle, and presence/absence surveys if required;
- A survey for badger setts within 30m of construction sites;
- A survey for features that could be used by roosting bats on trees and structures to be affected and presence/absence surveys if required;
- Dependent on the detailed design of the proposed bridges over The River Esk and Irt, a scour risk assessment and Water Framework Directive Assessment may be needed

The detailed scheme design and construction plan must include measures to avoid and mitigate anticipated impacts. The requirement for mitigation will depend on the results of the surveys and assessments outlines above but are likely to include;

- The detailed design of the bridges should aim to minimise ecological impacts by being a free spanning structure, with minimal footprint for the footings and work area, and located in the least ecologically important location.
- Measures to protect natterjack toads will be required during construction and may be required to protect toads in the long-term on migration routes.
- The route should not be situated over the root system of the ancient tree or within a zone that would be vulnerable to falling debris as the tree senesces.
- Adhere to Pollution Prevention Guidelines and other best practice guidance for working near water.
- Clearance of shrubs, scrub and trees (or in very close proximity to riverbanks or structures suitable for use by nesting birds) must be undertaken outside the peak bird nesting season or be preceded by a nesting bird check by a suitably experienced ecologist.

- Dependent on a habitat assessment for reptiles based on a site visit, measures to reduce the risk of reptiles being harmed during construction are likely to be required for at least some sections of the route.
- Any work within 7m of Japanese knotweed or Himalayan balsam should be conducted in line with an appropriate method statement to avoid their spread.

Current planning policy demands that construction projects not only minimise their ecological impact, but provide enhancements wherever possible. Ecological enhancement measures proportional to the scale of the proposal should be built into the detailed design of the scheme. The Preliminary Ecological Appraisal and consultation should help to identify suitable measures, but these could include;

- Retrofitting features to protect natterjack toads on existing infrastructure in known mortality hot-spots;
- Including features bat could use for roosting in new bridges.
- Constructing artificial hibernacula for reptiles and amphibians;
- Creating high quality invertebrate habitats alongside the paths; or
- A signing and interpretation programme to allow users of the path to explore and understand the surrounding environment.

6 Index and Bibliography

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Appendix 1: Nature Conservation Sites with Non-statutory Designations

Name	Location and proximity	Description (if known)	Anticipated impacts
Muncaster Castle Wood CWS and SIS	SD 101 960 930m east	The CWS is primarily broadleaved woodland (including ancient semi-natural woodland) with a small section of conifers. Also includes wood pasture and parkland habitat and a small area of lowland meadow habitat. The SIS designation covers a second area of woodland to the north of the main CWS site.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Notable road verge	Exact extent unknown	Croftlands Drive east of Ravenscar. Approximately 150m of verge at 'The Grove'.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening habitats and distance.
Newbiggin Grasslands CWS	SD 092 939 Within 20m	Two sites. The westernmost is dominated by coastal floodplain grazing marsh with some lowland wet grassland. The easternmost area is dominated by coastal saltmarsh with coastal and floodplain grazing marsh and mudflats present along the adjacent river.	The route will follow an existing road on the opposing side of a raised railway embankment with no construction anticipated. No direct impacts or long-term disturbance to wildlife are anticipated.
Monks Moors CWS	SD 087 927 150m east	Coastal and floodplain grazing marsh.	The route will follow an existing road with no construction anticipated. Given the intervening distance no direct impacts or long-term disturbance to wildlife are anticipated.
KEY: CWS: County Wildlife Site			

Table 2.1: Nature conservation sites with non-statutory designations within 1km of the proposed route (continues).

Name	Location and proximity	Description (if known)	Anticipated impacts
Williamson's Moss CWS	SD 083 916 70m east	A basin mire within the coastal plain becoming invaded by willow carr. The site includes dry neutral grassland with bramble <i>Rubus fruticosus</i> agg. and gorse <i>Ulex</i> sp., wetter grassland with purple moor grass <i>Molinia caerulea</i> and rushes and some areas are under water. In the northern end heath species such as cotton grass and bog mosses are present. More unusual species present within the site include royal fern <i>Osmunda regalis</i> , bog bean <i>Menyanthes trifoliata</i> and bog asphodel <i>Narthecium ossifragum</i> . The bloody-nosed beetle <i>Timarcha tenebricosa</i> has been recorded in this site.	The route will follow an existing road with no construction anticipated. No impacts are therefore anticipated on the plant or invertebrate interest for which this site is designated.
Skelda Hill CWS	SD 081 910 30m east	Pasture bound by hedgerows. Site supports breeding natterjack toads.	The route will follow an existing road with no construction anticipated. Further assessment will be required to determine whether the anticipated increase in cycle and pedestrian traffic would pose an increased mortality risk for migrating toads.
Nook Railway Embankment CWS	SD 091 910 800m east	Area of railway embankment wider than elsewhere. Land appears to support mixed habitats.	The route will follow an existing road with no construction anticipated. Given the intervening distance no direct impacts or long-term disturbance to wildlife are anticipated.
Inmans Tarn CWS	SD 090 888 400m west	Two areas of lowlands fens within pastureland with scattered shrubs or trees.	The route will follow an existing road with no construction anticipated. Given the intervening distance no direct impacts or long-term disturbance to wildlife are anticipated.
KEY: CWS: County Wildlife Site			

Table 2.1 (continued): Nature conservation sites with non-statutory designations within 1km of the proposed route (continues).

Name	Location and proximity	Description (if known)	Anticipated impacts
Barfield Tarn CWS	SD 107867 200m west	Lake with fringing reedbed to the south and broadleaved woodland to the north.	The route closest to this site will follow an existing road and track. Whilst path construction will be required within 500m, given the intervening distance no direct impacts or disturbance to wildlife anticipated.
Black Combe SIS	650m east	587ha site comprising blanket bog, grass moorland and upland heath. No Further information is provided in relation to the designation but records of the notable <i>Barypeithes sulcifrons</i> weevil are present in the SIS.	Given the distance of the proposed path construction from the SIS boundary no direct impacts are anticipated on this site. As SIS does not include the whole moor, it is assumed that the habitat along the proposed is considered to be of lesser significance to invertebrates. Impacts on the invertebrate populations at this site are therefore considered unlikely, but this should be confirmed by a habitat assessment.
Stangrah Quarry CWS	SD112 850 300m west	Good quality semi-improved grassland.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
The mosses CWS	SD 112 843 440m west	Contains broadleaved woodland and fen.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
KEY: CWS: County Wildlife Site SIS: Site of Invertebrate Importance			

Table 2.1 (continued): Nature conservation sites with non-statutory designations within 1km of the proposed route (continues).

Name	Location and proximity	Description (if known)	Anticipated impacts
Nan Hill Grassland CWS	SD 112 838 600m west	No information available. Land appears to support mixed habitats including an area of scrub/shrubs.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Summer Hill CWS	SD 114 825 900m west	Site contains maritime cliffs and slopes and lowland dry acid grassland.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Arrow Moss CWS	600m south	Deciduous woodland and fens.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Silecroft Willow Carr CWS	SD 132 816 950m south	Deciduous woodland.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Niclewood CWS	SD 141 817 40m south	Deciduous woodland with ancient semi-natural areas.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Sheephouse Wood CWS	SD 147 822 Adjacent	Ancient broadleaved woodland with semi-natural and replanted sections.	The route will follow an existing road with no construction anticipated. Given the nature of the habitat within this site, no direct impacts or long-term disturbance to wildlife are anticipated.
Hole Honse Wood CWS	SD 152 828 Adjacent	Deciduous woodland with ancient semi-natural areas.	The route will follow an existing road with no construction anticipated. Given the nature of the habitat within this site, no direct impacts or long-term disturbance to wildlife are anticipated.
KEY: CWS: County Wildlife Site			

Table 2.1 (continued): Nature conservation sites with non-statutory designations within 1km of the proposed route (continues).

Name	Location and proximity	Description (if known)	Anticipated impacts
Lowscales Bank CWS	SD 157 827 Adjacent	This site is designated for the diverse range of high quality semi-natural habitats it supports. Higher ground is dominated by dry heath and acid grassland with a scree slope present. A basin mire is present on lower ground in the south and southeast of the site and includes an excellent variety of mire communities and supports unusual plant species.	The route will follow an existing road with no construction anticipated. No impacts are therefore anticipated on the habitats and plants for which this site is designated.
Blea Moss CWS	SD 168 840 60m east	Broadleaved and coniferous sections of woodland with an area that includes fens and reedbeds.	The route will follow an existing road with no construction anticipated. Given the nature of the habitat within this site, no direct impacts or long-term disturbance to wildlife are anticipated.
High Brow Meadows CWS	SD 180 832 60m north	No information available. Land appears to support mixed habitats.	The route will be situated on road, or using an existing alleyway, separated from this site by residential properties. As such no direct impacts or long-term disturbance to wildlife are anticipated.
Raylands Wood CWS	SD 181 836 330m	Woodland including an area of ancient semi-natural woodland.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
KEY: CWS: County Wildlife Site			

Table 2.1 (continued): Nature conservation sites with non-statutory designations within 1km of the proposed route (continues).

Name	Location and proximity	Description (if known)	Anticipated impacts
Millom Marsh CWS	SD 184 823 <10m	Coastal and floodplain grazing marsh. A notable foraging and hibernation area for natterjack toads. Millom Marsh is also noted in the adjacent SSSI designation to be high tide roost of importance to wildfowl and waders. Wall butterfly has also been recorded at this site.	Route creation will involve construction to upgrade an existing track, not currently in public access. As such construction and future use could endanger natterjack toads, discussed in Section 4.2. There may also a risk of disturbance to roosting birds, discussed in more detail in Section 4.3.
Brocklebank Wood CWS	SD 170 847 420m north	Ancient replanted deciduous woodland.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Middle Shaw CWS	SD 196 849 600m south east	Coastal and floodplain grazing marsh	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Fox's Wood CWS	SD 184 858 Adjacent	Ancient semi-natural broadleaved woodland and mixed (mainly conifer) replanted ancient woodland.	The route will follow an existing road with no construction anticipated. Given the nature of the habitat within this site, no direct impacts or long-term disturbance to wildlife are anticipated.
High Boghouse Woods CWS	SD 189 863 100m west	Ancient semi-natural broadleaved woodland.	The route will follow an existing road with no construction anticipated. Given the nature of the habitat within this site, no direct impacts or long-term disturbance to wildlife are anticipated.
KEY: CWS: County Wildlife Site SIS: Site of Invertebrate Importance			

Table 2.1 (continued): Nature conservation sites with non-statutory designations within 1km of the proposed route (continues).

Name	Location and proximity	Description (if known)	Anticipated impacts
Broadhole Meadow CWS	SD 190 874 370m west	Upland hay meadow.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
Duddon Bridge and Stanley Wood CWS	SD 194 878 Adjacent	Broadleaved woodland, most of which is ancient woodland with semi-natural and replanted sections. The ground flora contains dog's mercury, wood sorrel, greater stitchwort and ferns. Japanese knotweed is noted to be present on the A595 verge adjacent to this site.	Full path construction is anticipated through this woodland. As such anticipated impacts could include the need for tree removal, damage to the root system of trees and the loss of ground flora. The scale and significance of this impact cannot be determined without a site survey.
Rawfold Wood CWS	440m north	Broadleaved woodland, most of which is ancient woodland with semi-natural and replanted sections. A small felled section is present.	No impact anticipated due to small scale of proposal, the nature of the habitats within the designated site and the intervening distance.
KEY: CWS: County Wildlife Site			

Table 2.1 (continued): Nature conservation sites with non-statutory designations within 1km of the proposed route.