



THE
ENVIRONMENT
PARTNERSHIP



UNITED UTILITIES

HAWESWATER AQUEDUCT RESILIENCE PROGRAMME - PROPOSED BOWLAND SECTION

BOWLAND HABITATS REGULATIONS ASSESSMENT (RVBC-BO-APP-010)

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Executive Summary

1. United Utilities (UU) maintains and operates the Haweswater Aqueduct, which runs 110 km from Cumbria to Greater Manchester. Inspections of the aqueduct identified areas of concern that pose a potential future risk to water supply. In response UU is replacing six tunnel sections of the aqueduct, collectively this is known as the Haweswater Aqueduct Resilience Programme (HARP). This Habitats Regulations Assessment (HRA) is in relation to the replacement works for the tunnel known as Proposed Bowland Section and supports associated planning applications to Ribble Valley Borough Council (RVBC) and Lancaster City Council (LCC).
2. The proposed works comprise the installation of a single line tunnel and conduit sections which is 16 km long and runs between Newton-in-Bowland at the southern end and 4 km south east of Wray at the northern end. Above ground works will comprise site compound and working areas at the start and end of the section. Tunnelling will commence from the launch compound at the southern end and will drive north to the reception compound. All excavated material will be removed at the southern end (with the exception of materials resulting from creation of the reception shaft) and transported to Waddington Fell Quarry. A number of highways improvements works are required to facilitate construction traffic access to the rural compounds including road widening and passing places, a new crossing of the River Ribble and use of existing parking facilities near Clitheroe, in turn these works would need their own temporary compounds.
3. Ten European sites identified within 20km of the proposed works at Bowland have been scoped into the assessment to examine any potential impacts on these sites that could arise from the proposals. These designations are:
 - Bowland Fells SPA
 - Morecambe Bay and Duddon Estuary SPA
 - Morecambe Bay SAC
 - Morecambe Bay Ramsar
 - Leighton Moss SPA
 - Leighton Moss Ramsar
 - Calf Hill & Crag Woods SAC
 - Ingleborough Complex SAC
 - North Pennine Dales Meadows SAC
 - Morecambe Bay Pavements SAC
4. None of the designations are crossed by the above ground elements of the proposed development and all but two of the designations are >5 km away. However, the following potential impact pathways have been identified that could possibly result in a likely significant effect on one or more of the identified European sites and are therefore taken through to Appropriate Assessment:
 - Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of waterborne pollution travelling to designations via hydrological linkages during the construction and operational phases of the development.

- Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of airborne pollution travelling to designations during the construction phase of the development.
 - Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of changes to groundwater as a result of the development including decommissioning of the existing asset.
 - Disturbance to species associated with the SPA / Ramsar or loss of supporting habitat for these species during the construction and operational phases of the development.
5. This assessment concludes that, without mitigation, there will be no adverse effect on the integrity of any European sites alone or in-combination with other projects or plans.

1.0 Introduction

Background

- 1.1 United Utilities (UU) maintains and operates the Haweswater Aqueduct, a pipeline running 110 km from Cumbria and through Lancashire to Greater Manchester. The pipeline is comprised of multiple pipe and single tunnel sections. Inspections of the aqueduct identified areas of concern that posed a potential future risk to both water quality and supply. In response UU is replacing all tunnel sections of the aqueduct. Each tunnel section is an independent development, the completion of which is not reliant on any other tunnel section, therefore each section will be accompanied by its own Environmental Statement to support the planning application (some tunnel sections require multiple planning applications where they cross planning authority boundaries). Collectively this is known as the Haweswater Aqueduct Resilience Programme (HARP).
- 1.2 The Environment Partnership Limited (TEP) was commissioned by United Utilities to undertake a Habitats Regulations Assessment (HRA) of the Proposed Bowland Section of the larger HARP scheme and supports associated planning applications to Ribble Valley Borough Council (RVBC) and Lancaster City Council (LCC). The HRA determines firstly in the Scoping Assessment whether the proposals could possibly have a significant effect on any European sites or Ramsar sites and then (for any sites carried forward to Stage 2) the Appropriate Assessment determines if the proposals could result in a significant adverse effect on the integrity of these sites.
- 1.3 The assessment covers the Proposed Bowland Section (henceforth referred to as 'the Project'), located in north Lancashire between National Grid References SD689503 and SD637655. It comprises the replacement of the tunnel section towards the central section of the existing Haweswater Aqueduct between Newton-in-Bowland at the southern end and 4 km south east of Wray at the northern end (illustrated at figure G7478.03.001.3).
- 1.4 The existing aqueduct between these areas would be replaced with a single tunnel. The new tunnel would be created using a tunnel boring machine (TBM) boring via a portal opening from the southern end 16 km north to a 15 m deep reception shaft at the northern end. Tunnel boring activities will be at depths of approximately 150 m depth for the majority of the section, increasing to 380 m below the surface when passing under White Hill in the Trough of Bowland.
- 1.5 Above-ground works include a mix of temporary construction activities and permanent installations. Above-ground works consist of two main working areas:
 - Newton-in-Bowland Compound would be the launch facility in the south, located approximately 440 m west of Newton-in-Bowland (within RVBC).
 - Lower Houses Compound would be the reception facility in the north, located approximately 4 km south east of Wray and 1.6 km northwest of Low Gill (within LCC). The compound would include surplus materials storage (arising from the shaft) within its boundaries.

- 1.6 Tunnel arisings would be extracted at the southern (launch) compound and transported to Waddington Fell Quarry, accessed by the B6478, for permanent treatment and storage.
- 1.7 Transport routes for the Newton-in-Bowland Compound for light vehicles and HGVs will be from Junction 31 of the M6 along the A59 then the A671 Pimlico Link Road and B6478, with an adapted route along Clitheroe Road for abnormal loads. Transport routes for the Lower Houses Compound for light vehicles and limited HGVs will be from the A683 along the B6480 and continuing onto Long Lane with an adapted route through Wray for abnormal loads.
- 1.8 Site access for the Newton-in-Bowland Compound would be via a temporary haul road approximately 1 km in length running from the B6478 just south of Newton-in-Bowland and crossing the River Hodder with a temporary new bridge to reach the compound area. Site access for the Lower Houses Compound would be from Park House Lane in the north east with site traffic exiting by the unnamed road on the western edge of the compound. Abnormal loads and HGVs that can't use the north east entrance will both access and depart the site via the western access.
- 1.9 Part of construction access includes the proposed Ribble Crossing, which is one of two options to allow the movement of construction vehicles in and around the Clitheroe area. The proposed Ribble Crossing will require a temporary road bridge crossing the River Ribble just north of Clitheroe (within RVBC).
- 1.10 Construction activities are anticipated to continue for a period of 6 years, (Q2 2023 to Q4 2028) excluding commissioning (connecting to the existing asset) and land reinstatement. The exact timing of commissioning depends on the connection approach and if requiring a full outage of the aqueduct this can only be undertaken once (in September / October) every two years. Land reinstatement would be carried out progressively, starting as early as possible at each of the construction compounds. This involves land restoration activities being commenced in appropriate locations at the compounds whilst construction and commissioning activities are still underway. Blasting works to form the drive portal at the launch compound (Newton-in-Bowland Compound) is anticipated to occur over a three to four month period in the latter part of 2023.
- 1.11 Construction compounds are the locations within which construction activities would be undertaken. The construction compounds would contain tunnel launch and reception facilities (e.g. vertical tunnel shafts), tunnel slurry treatment facilities, diesel generators (where necessary), welfare and administration facilities, vehicle parking, surplus materials storage areas, and water management areas.
- 1.12 The locations of construction compounds for the proposed Bowland Section are shown at Figure G7478.03.001.3.
- 1.13 Enabling works would include fencing working areas and preparing sites. Working areas would be topsoil stripped and construction phase drainage installed where required. As required, trees would be felled and vegetation would be cleared. Compounds and laydown areas would be constructed and safe access and egress to and from the sites would be provided via the local road network.

- 1.14 Lighting would be required for safety reasons and where 24-hour working is required. Lighting designs and locations would minimise light spill towards any sensitive locations.
- 1.15 For the majority of the length of the replacement aqueduct there would be no permanent above-ground structures with much of the new sections of aqueduct being located deep below ground level. Permanent new valve houses would be built at the end of each replacement tunnel section, these would be single storey structures approximately 11 m wide by 12 m long.
- 1.16 Land used for temporary compounds would be reinstated after completion of construction works with temporary access roads being removed. Where launch and reception facilities (e.g. shaft and portal) exist, these would be covered and reinstated at ground level.
- 1.17 Once the new section of aqueduct has been constructed, the replaced section of aqueduct would be decommissioned, with the new asset being tested and commissioned before the existing sections of aqueduct are decommissioned.
- 1.18 The new tunnel sections would connect to the existing overflow pipes that allow the aqueduct to be drained to existing outfall points. The overflows are only used in an emergency or for rare maintenance requirements and represents no change to the existing operational activities of the aqueduct. The only operational phase change resulting from the proposed development is the discharge of water from the decommissioned asset via the existing overflow pipes as a result of water ingress into the unused tunnel sections.

The Habitats Regulations Procedure

- 1.19 The Habitats Directive (92/43/EEC) established a network of designated sites, within the European Community, with the objective of protecting sites that are considered to be of exceptional importance in respect of rare, endangered or vulnerable natural habitats and species. These sites are European designated sites and are known as Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Offshore Marine Sites (OMS).
- 1.20 The Habitats Directive (92/43/EEC) transposed into UK law in 1994 as The Habitats Regulations, which was subsequently amended and is known as the Conservation of Habitats and Species Regulations 2017. A number of changes have been made to this by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, referred to as the 2019 Regulations. Under the 2019 Regulations, SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network. The 2019 Regulations have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK.
- 1.21 Although Ramsar sites do not form part of the national site network, National planning policy recommends that Ramsar sites should be afforded the same level of consideration as SAC and SPA designated sites.

- 1.22 Under the Habitats Regulations the granting of approval (i.e. planning permissions, licenses and consents) for developments is restricted if they are likely to have a significant adverse effect on an SAC, SPA or Ramsar site.
- 1.23 Guidance (EC, 2001¹; IPC, 2011²) on undertaking assessment of plans or projects that may impact upon designated European sites recommends a staged approach to the assessment process:
- Screening (Step 1): The process of identifying potentially relevant European sites and the likely impacts of a project upon the designated features of a European site, either alone or in combination with other plans and projects, and considering whether the impacts are likely to be significant.
 - Appropriate Assessment (Step 2): Assessment of the impacts, taking into account proposed mitigation measures, on the integrity of the European site, either alone or in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. If it cannot be concluded beyond reasonable scientific doubt that the project would not adversely affect site integrity then development consent cannot be issued unless the steps set out in Stages 3 and 4 are successfully concluded.
 - Assessment of Alternative Solutions (Step 3): Examining alternative ways of achieving the objectives of the project, to establish whether there are solutions that would avoid an adverse effect on the integrity of a European site(s).
 - Assessment of IROPI (Step 4): If it is shown that there are no alternative solutions then the project can receive development consent only if it can also be demonstrated that it should proceed for imperative reasons of overriding public interest (IROPI). Where IROPI can be shown then compensatory measures required to maintain the overall coherence of the site or integrity of the European site network will need to be identified and secured.
- 1.24 All four stages of the process are referred to cumulatively as the Habitats Regulations Assessment (HRA). Figure 1 taken from the Planning Inspectorate Advice Note 10 (Version 8 – Planning Inspectorate, November, 2017), sets out the recommended steps in the process.

¹ European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 Sites. Methodological guidance on the provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC

² The Infrastructure Planning Commission (2011). Habitat Regulations Assessment for nationally significant infrastructure projects

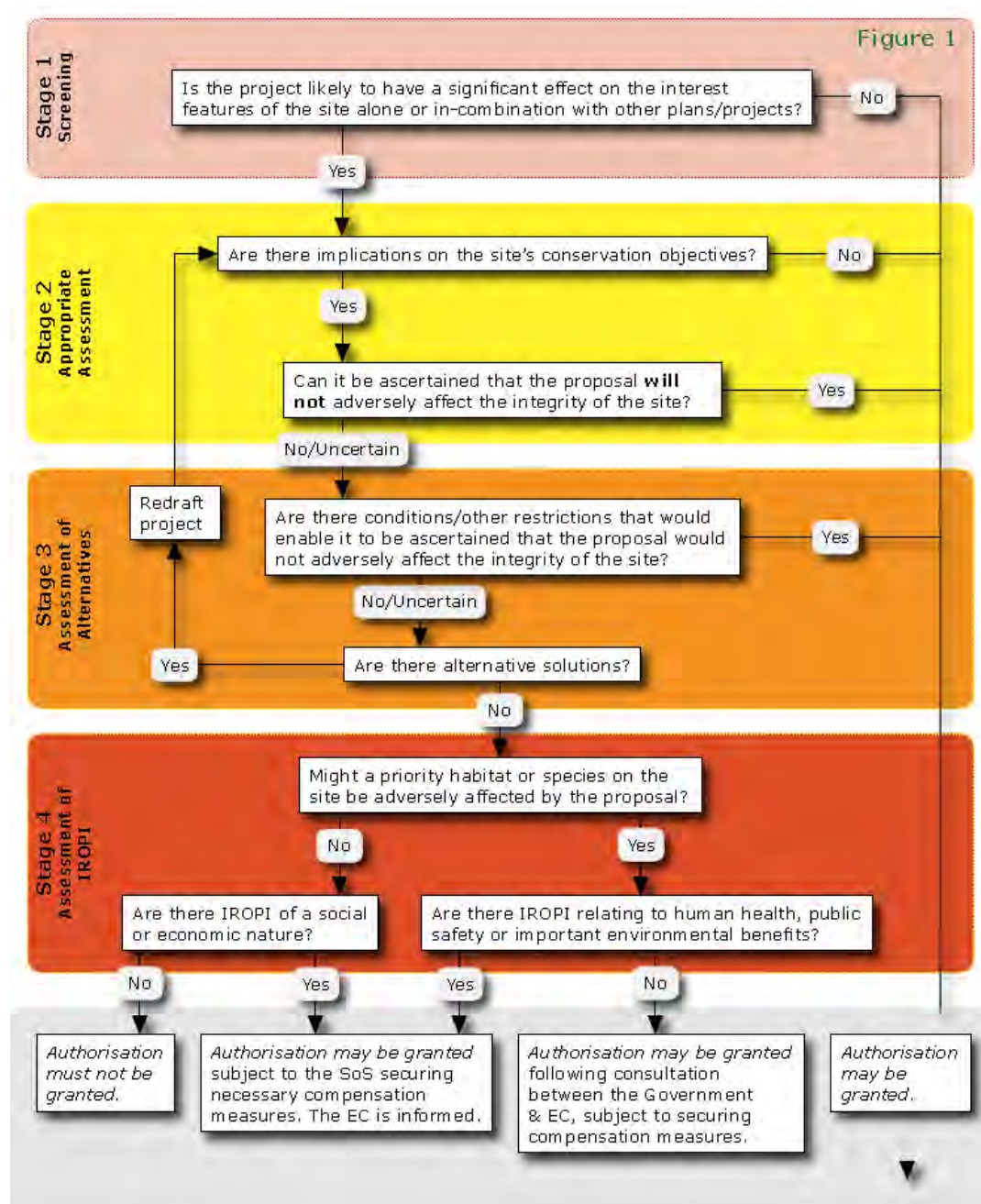


Figure 1. The Habitats Regulations Assessment process (Figure 1 from Planning Inspectorate Advice Note 10).

2.0 Summary of Baseline Information

European Sites considered within influencing distances

- 2.1 The Proposed Programme of Works is located within 20 km of the following European sites:

Table 1 - European Sites within 20 km

Site name:	Designation:	Distance (km):
Bowland Fells	SPA	2.6km north of southern area
Morecambe Bay & Duddon Estuary	SPA	15.6km west of northern area
Morecambe Bay	SAC Ramsar	15.6km west of northern area
Leighton Moss	SPA Ramsar	17.2km northwest of northern section
Calf Hill & Crag Woods	SAC	9.1km southwest of northern area
Ingleborough Complex	SAC	10.3km northeast of northern area
North Pennine Dales Meadows	SAC	19km northeast of northern area 3.1km northeast of southern area
Morecambe Bay Pavements	SAC	13km northwest of northern area

- 2.2 Therefore, on a precautionary basis, all of these sites have been taken forward for further assessment to determine whether a likely significant effect could occur.
- 2.3 The locations of these European sites relative to the Proposed Development are shown at Figure G7478.03.001.3.
- 2.4 A summary of the European sites scoped in for assessment and potential impact pathways are given below. Full descriptions of the European sites scoped in are given in Appendix A.

Bowland Fells SPA (UK9005151)

- 2.5 Bowland Fells is classified as a Special Protection Area because of its importance for the Annex I upland breeding birds hen harrier and merlin. It also supports an internationally important population of breeding lesser black-backed gulls which is proposed as an additional feature of the site. The Bowland Fells SPA encompasses the main upland block within the area of Lancashire known as the Forest of Bowland.

Morecambe Bay/Duddon Estuary Special Protection Area (SPA) (UK9020326)

- 2.6 The site covers an area of 66,899ha, extending between Rossall Point in Lancashire and Drigg Dunes in Cumbria. The site includes the former Morecambe Bay SPA and Duddon Estuary SPA and an extension to include the Ravenglass Estuary and intervening coast and the shallow offshore area off south west Cumbria coast.
- 2.7 This site qualifies under Article 4.1 of the Directive (2009/17/EC) as it is used regularly by 1% or more of the GB populations of the following species listed in Annex I in any season:
- Whooper swan (non-breeding)
 - Little egret (non-breeding)
 - European golden plover (non-breeding)
 - Bar-tailed Godwit (non-breeding)
 - Ruff (non-breeding)
 - Mediterranean gull (non-breeding)
 - Little tern (breeding)
 - Sandwich tern (breeding)
 - Common tern (breeding)
- 2.8 The area also qualifies under Article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following species listed in Annex I in any season: pink-footed goose (non-breeding), common shelduck (non-breeding), northern pintail (non-breeding), Eurasian oystercatcher (non-breeding), grey plover (non-breeding), common ringed plover (non-breeding), Eurasian curlew (non-breeding), black-tailed godwit (non-breeding), ruddy turnstone (non-breeding), red knot (non-breeding), sanderling (non-breeding), dunlin (non-breeding), common redshank (non-breeding), lesser black-backed gull and European herring gull (breeding)
- 2.9 The site qualifies under Article 4.2 of the Directive (2009/147/EC) for its assemblage of over 20,000 waterbirds and seabirds.

Morecambe Bay SAC (UK0013027)

- 2.10 Morecambe Bay is a large, very shallow, predominantly sandy bay at the confluence of four principal estuaries, the Leven, Kent, Lune and Wyre. The Duddon Estuary is within the SAC but north of the bay itself, although directly connected to it by Walney Channel. At low tide vast areas of intertidal sandflats are exposed, with small areas of mudflat, particularly in the upper reaches of the associated estuaries.
- 2.11 The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:
- Atlantic decalcified fixed dunes (Calluno-Ulicetea). (Coastal dune heathland)
 - Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
 - Coastal lagoons
 - Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*). (Dunes with creeping willow)
 - Embryonic shifting dunes

- Estuaries
- Fixed dunes with herbaceous vegetation ("grey dunes"). (Dune grassland)
- Humid dune slacks
- Large shallow inlets and bays
- Mudflats and sandflats not covered by seawater at low tide. (Intertidal mudflats and sandflats)
- Perennial vegetation of stony banks. (Coastal shingle vegetation outside the reach of waves)
- Reefs
- Salicornia and other annuals colonising mud and sand. (Glasswort and other annuals colonising mud and sand)
- Sandbanks which are slightly covered by sea water all the time. (Subtidal sandbanks)
- Shifting dunes along the shoreline with *Ammophila arenaria*. ("White dunes")

2.12 Qualifying species: The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Great crested newt *Triturus cristatus*

Morecambe Bay Ramsar (UK11045)

2.13 The site covers an area of 37,363.17ha and represents the largest continuous intertidal area in Britain. The site comprises the estuaries of five rivers, intertidal mud and sandflats, associated saltmarshes, shingle beaches, and other coastal habitats. It is part of a series of west coast estuaries of outstanding importance for numerous species of passage, breeding and wintering waterbirds.

2.14 The Ramsar site supports the third largest number of wintering wildfowl in Britain. Breeding birds include gulls and terns. Human activities include recreation, hunting, fishing, and livestock grazing.

2.15 The site qualifies under Ramsar criterion 4 as a staging area for migratory waterfowl including internationally important numbers of passage ringed plover *Charadrius hiaticula*.

2.16 The site qualifies under Ramsar criterion 5 for regularly supporting internationally important populations of the following species:

2.17 Species regularly supported during the breeding season:

- Lesser black-backed gull
- Herring gull
- Sandwich tern

2.18 Species regularly supported in spring/autumn:

- Great cormorant
- Common shelduck
- Northern pintail

- Common eider
- Eurasian oystercatcher
- Ringed plover
- Grey plover
- Sanderling
- Eurasian curlew
- Common redshank
- Ruddy turnstone
- Lesser black-backed gull

2.19 Species with peak counts in winter:

- Great crested grebe
- Pink-footed goose
- Eurasian wigeon
- Common goldeneye
- Red-breasted merganser
- European golden plover
- Northern lapwing
- Red knot
- Dunlin
- Bar-tailed godwit

2.20 The site also qualifies under Criterion 5 for supporting a waterfowl assemblage of international importance during the winter period, supporting 223,709 waterfowl.

Leighton Moss SPA (UK9005091)

2.21 Leighton Moss contains the largest reedbed in North West England and the only large reedbed in Lancashire. The site is designated for the breeding population of bittern (*Botaurus stellaris*) it supports.

Leighton Moss Ramsar (UK11035)

2.22 The Ramsar site is designated under Criterion 1 for supporting representative, unique or rare wetland types (inland wetlands). It also supports nationally important numbers of breeding marsh harrier, shoveler on passage and wintering water rail.

Calf Hill & Crag Woods SAC (UK0030106)

2.23 These old sessile oak *Quercus petraea* woods occupy north- and south-facing slopes of a valley on millstone grit. Oak dominates in the canopy with birch *Betula* sp., rowan *Sorbus aucuparia* and holly *Ilex aquifolium*. The ground flora ranges from areas of abundant bilberry *Vaccinium myrtillus*, through grassy areas, to rich moss carpets. Small areas of alder *Alnus glutinosa* flushes also occur.

2.24 Qualifying habitats: The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae). (Alder woodland on floodplains)

- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. (Western acidic oak woodland)

Ingleborough Complex SAC (UK0012782)

- 2.25 Ingleborough is Britain's finest karst area, the characteristic limestone landforms having been produced largely under glacial conditions. It is particularly noted for extensive dry stone pavements, dry valleys and gorges, shakeholes and sinkholes. Where limestone occurs at the surface, there is calcareous grassland dominated by blue-moor grass *Sesleria albicans*, while elsewhere blanket-bog is dominated by hare's-tail cottongrass *Eriophorum vaginatum*. Where flushing occurs the blanket-bog becomes floristically richer with sundew *Drosera rotundifolia*, cranberry *Vaccinium oxycoccos* and bog asphodel *Narthecium ossifragum*. It has the most extensive series of limestone pavements in the UK.
- 2.26 Qualifying habitats: The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:
- Blanket bogs
 - Limestone pavements
 - Petrifying springs with tufa formation (Cratoneurion). (Hard-water springs depositing lime)
 - Tilio-Acerion forests of slopes, screes and ravines. (Mixed woodland on base-rich soils associated with rocky slopes)
 - Alkaline fens. (Calcium-rich springwater-fed fens)
 - Calcareous rocky slopes with chasmophytic vegetation. (Plants in crevices in base-rich rocks)
 - *Juniperus communis* formations on heaths or calcareous grasslands. (Juniper on heaths or calcareous grasslands)
 - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae). (Purple moor-grass meadows)
 - Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco Brometalia). (Dry grasslands and scrublands on chalk or limestone)

North Pennine Dales Meadows SAC (UK0014775)

- 2.27 This site contains a series of isolated fields within several valleys encompassing the range of variation exhibited by mountain hay meadows in the UK. The grasslands included show very limited effects of agricultural improvement and have good conservation of structure and function. A wide range of rare and local meadow species are contained within the meadows, including globeflower *Trollius europaeus*, the lady's-mantles *Alchemilla acutiloba*, *A. monticola* and *A. subcrenata*, and spignel *Meum athamanticum*.
- 2.28 Qualifying habitats: The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae). (purple moor-grass meadows)
 - Mountain hay meadows

Morecambe Bay Pavements SAC (UK0014777)

- 2.29 This site is the best British example of lowland limestone pavements that range from low to moderate altitudes.
- 2.30 Calcareous grasslands dominated by blue moor-grass *Sesleria caerulea* have an overall northern character but are also rich in southern lowland species. There is a wide range of structural variation associated with intensity of grazing and the presence of cliffs, screes, and limestone pavements on the margins of the grassland stands. There are important transitions to calcareous scrub (including juniper scrub) and ash-lime woodlands. Heather *Calluna vulgaris* is a frequent component of the grassland sward and where the soils are deeper a heathland community occurs in an intricate mosaic with the grassland.
- 2.31 The ash-dominated woodland around Morecambe Bay contains many patches of small-leaved lime and a rich assemblage of rare species, including fingered sedge, wood fescue *Festuca altissima* and mezereon *Daphne mezereum*.
- 2.32 Hawes Water is a lowland lake on a predominantly Carboniferous limestone foundation, with a substrate of deep lacustrine shell-marl (remains of shells of lake-dwelling animals). The water is highly calcareous and the lake is fed by springs within it. This site is considered to be the best example of a lowland lake with stoneworts *Chara* spp. in England, owing to the clarity, low nutrient status and high calcium content of its water. The rare rugged stonewort *Chara rudis* and scarce species *C. aspera*, *C. hispida* and *C. pedunculata* occur here. Gait Barrows supports strong populations of the narrow-mouthed whorl snail *Vertigo angustior* on the mossy clint (the limestone blocks which make up pavements) tops of limestone pavements at transitions to woodland, an unusual habitat for the species.
- 2.33 Qualifying habitats: The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:
- Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae. (Calcium-rich fen dominated by great fen sedge (saw sedge))
 - European dry heaths
 - Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. (Calcium-rich nutrient-poor lakes, lochs and pools)
 - *Juniperus communis* formations on heaths or calcareous grasslands. (Juniper on heaths or calcareous grasslands)
 - Limestone pavements
 - Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. (Western acidic oak woodland)
 - Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco Brometalia). (Dry grasslands and scrublands on chalk or limestone)
 - *Taxus baccata* woods of the British Isles. (Yew-dominated woodland)*
 - Tilio-Acerion forests of slopes, screes and ravines. (Mixed woodland on base-rich soils associated with rocky slopes)
- 2.34 Qualifying species: The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Narrow-mouthed whorl snail *Vertigo angustior*

Species and Habitat Records

Desk Based Records

- 2.35 Data gathering from a combination of web-based sources and local biological records centres was undertaken in August 2018 and updated in summer 2020 by United Utilities.
- 2.36 Additional desk study searches were undertaken where it is considered that existing information is insufficient to appropriately assess likely significant ecological effects. This particularly relates to desk study searches for non-statutory designated sites of nature conservation interest and protected / notable species. As part of the desk study the following data sources were contacted or accessed for records:
- Lancashire Environment Record Network (LERN)
 - The Multi Agency Geographic Information for the Countryside (MAGIC) website (<https://magic.defra.gov.uk/MagicMap.aspx>)
 - Google maps (<https://www.google.co.uk/maps>)
 - Environment Agency (North West region Analysis and Reporting team) – information requested August 2019. In addition to Open Government (<https://data.gov.uk/>), macroinvertebrate / macrophyte site and metric data, a request for data relating to freshwater invertebrates, freshwater macrophyte and diatom, and protected species records was submitted for selected watercourses across the Proposed Programme of Works.
- 2.37 Extensive bird records were obtained from Lancashire with regards to potential bird migratory routes and functionally linked land for species of conservation concern associated with the European sites (see Environmental Statement Technical Appendix 9A.1, Ref LCC_RVBC-BO-TA-009-01-01).
- 2.38 Additional sensitive bird records of Schedule 1 species winter roost sites, including hen harrier and merlin were obtained from the RSPB in October 2020.

Field Surveys

- 2.39 A full suite of ecological surveys were undertaken in 2019/20 by Bowland Ecology Ltd and Ricardo to support the Proposed Programme of Works and included:
- Extended phase 1 habitat surveys
 - NVC surveys
 - Great crested newt (GCN) surveys
 - Hedgerow surveys
 - Wintering bird surveys
 - Breeding bird surveys
 - Bat activity surveys
 - Badger surveys
 - Water vole, otter and crayfish surveys
 - Aquatic walkover surveys

- 2.40 A Groundwater Dependant Terrestrial Ecosystems (GWDTE) survey was carried out by Bowland Ecology Limited and a GWDTE assessment was undertaken by Jacobs' water environment team. The GWDTE assessment included analysis of habitat and botanical / wetland community data alongside hydrological data to identify potential GWDTE located within 200 m from compounds, 250 m from access roads and 500 m from shafts.
- 2.41 The initial scoping distance for shafts was later refined. The Sichardt method (e.g. Preene et al, 2016) was used to estimate the dewatering zone of influence around each of the shafts at each compound that would be expected to intercept groundwater. This was applied using the estimated drawdown of groundwater levels to the base of the shaft during construction. A minimum zone of influence of 25 m was assumed and was applied for the Lower Houses shaft (the Newton-in-Bowland compound as a portal entrance instead of a shaft). This was considered to be a conservative estimate.
- 2.42 The GWDTE assessment is provided in Environmental Statement Technical Appendix 7.2 (Ref LCC_RVBC-BO-TA-007-002). The assessment was based on general EIA methodology and criteria from the Design Manual for Roads and Bridges (DMRB) HD45/09 Road Drainage and the Water Environment (hereafter referred to as HD45/09). The methodology was also based upon discussion with the regulatory bodies during the scoping stage of Environmental Impact Assessment (EIA).

3.0 Screening Assessment

- 3.1 This section provides Stage 1 of the Habitats Regulations Assessment which determines if the scheme could possibly have a significant effect on each of the European sites to be assessed.
- 3.2 With due consideration to the proposed development type, the following impact pathways have been identified that could potentially affect the conservation status of the identified European sites, which will be further assessed:
- Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of waterborne pollution travelling to designations via hydrological linkages during the construction and operational phases of the development.
 - Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of airborne pollution travelling to designations during the construction phase of the development.
 - Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of changes to groundwater as a result of the development including decommissioning of the existing asset.
 - Disturbance to species associated with the SPA / Ramsar or loss of supporting habitat for these species during the construction and operational phases of the development.
- 3.3 Table 2 considers each of the impact pathways and confirms whether or not the proposed development has a risk or possibility of causing a likely significant effect on each of the European designated sites identified.
- 3.4 In relation to potential for waterborne pollution impacts, sites greater than 5 km from above ground works have been scoped out. Any pollutants resulting from the proposals that might enter local watercourses are highly unlikely to have perceivable impacts beyond this distance.
- 3.5 In relation to potential for impacts from airborne pollution, the Institute of Air Quality Management Guidance (IAQM, May 2020)³ requires identification of European designations within 10 km. Four designations are present within 10 km (Bowland Fells SPA, Calf Hill and Crag Woods SAC, Ingleborough Complex SAC, North Pennine Dales Meadows SAC) all other designations are scoped out.

³ IAQM 2020. A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.1

- 3.6 In relation to potential for impacts on ground water dependant terrestrial ecosystems (GWDTE), the groundwater assessment of potential effects has been based on an interpretation of data from the ground investigations which characterises the groundwater environment intercepted by the Proposed Bowland Section, and confirms groundwater levels (i.e. groundwater pressures above the tunnelled sections, areas of shallow groundwater conditions, geological settings and groundwater quality). Based on this information, an Overarching GWDTE Assessment Area was defined as a 200 m buffer in all directions around the surface works proposed development envelope (Ref: LCC_RVBC-BO-TA-007-002). As the nearest European site is located 2.6 km from the proposed surface works, this impact is scoped out.
- 3.7 No effects on GWDTE are predicted to arise during tunnel construction as the lining will be installed immediately behind the tunnel boring machine preventing any route for dewatering. However, there is potential for effects to arise on GWDTE from decommissioning of the existing tunnel which passes beneath the Bowland Fells SPA and this pathway has therefore been carried forward for Appropriate Assessment.
- 3.8 In relation to species disturbance, as all above ground works are greater than 2 km from designations, birds are the only qualifying features with a risk of being affected due to the potential use of supporting land outside the designation boundaries. Therefore only designations with birds as qualifying features have been scoped into the Appropriate Assessment.

Table 2: Summary of Screening

Designated Sites	Impact Pathways - risk/possibility of significant effect? (Planning Authority of potential impact source)			
	Waterborne pollution impacts	Airborne pollution impacts	Groundwater impacts	Disturbance to species
Bowland Fells SPA	Yes (both)	Yes (both)	Yes (both)	Yes (both)
Morecambe Bay and Duddon Estuary SPA	No	No	No	Yes (LCC)
Morecambe Bay SAC	No	No	No	No
Morecambe Bay Ramsar	No	No	No	Yes (LCC)
Leighton Moss SPA	No	No	No	Yes (LCC)

Designated Sites	Impact Pathways - risk/possibility of significant effect? (Planning Authority of potential impact source)			
	Waterborne pollution impacts	Airborne pollution impacts	Groundwater impacts	Disturbance to species
Leighton Moss Ramsar	No	No	No	Yes (LCC)
Calf Hill & Crag Woods SAC	No	Yes (LCC)	No	No
Ingleborough Complex SAC	No	No	No	No
North Pennine Dales Meadows SAC	Yes (RVBC)	Yes (RVBC)	No	No
Morecambe Bay Pavements SAC	No	No	No	No

- 3.9 Each of the European sites within Table 2 where a risk or possibility of a likely significant effect has been identified is now taken through to the second stage of the HRA process, the Appropriate Assessment, to determine whether the impact pathways identified could result in a significant adverse effect on the integrity of these sites. The Appropriate Assessment is provided in Section 4.0.
- 3.10 For those sites not carried forward to Appropriate Assessment, since there are no predicted impacts, there is no requirement to undertake an In-combination assessment to consider whether a significant impact could arise when combined with any other projects or plans.

4.0 Appropriate Assessment

- 4.1 This section assesses whether each of the potentially significant impact pathways identified as a result of the proposed scheme could have a significant adverse effect on the integrity of the European sites. The Appropriate Assessment is made within Table 3, with further information to support this assessment detailed below. The assessment is made with regard to each site's structure and function and its conservation objectives which are provided below.

Conservation Objectives

- 4.2 The conservation objectives for the Bowland Fells SPA, Morecambe Bay and Duddon Estuary SPA and the Leighton Moss SPA are as follows:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*
- *The population of each of the qualifying features, and,*
- *The distribution of the qualifying features within the site.*

- 4.3 The conservation objectives for the Calf Hill & Crag Woods SAC and the North Pennine Dales Meadows SAC are as follows:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- *The extent and distribution of qualifying natural habitats*
- *The structure and function (including typical species) of qualifying natural habitats, and*
- *The supporting processes on which qualifying natural habitats rely*

Waterborne Pollution Impacts

- 4.4 The Bowland Fells SPA and North Pennine Dales Meadows SAC are the only designations that fall within 5km of the above ground works. Due to the lack of any hydrological linkages between the above ground works and these two designations and with consideration of the distance and topography between the above ground works and these designations, there are no opportunities for waterborne pollution from the proposed development to reach these sites.

Air Quality Impacts

- 4.5 An assessment has been carried out to fully determine potential air quality impacts of the construction phase of the scheme on designated sites including European designations covered by HRA. Chapter 18 of the Environmental Statement considers air quality issues (Ref: LCC_RVBC-BO-ES-018) and is supported by Technical Appendices 18.1 and 18.2 (LCC_RVBC-BO-TA-018-001 and 002) and Figure 18.1 (LCC_RVBC-BO-FIG-018-001).
- 4.6 The Air Quality ES chapter included the assessment of the potential air quality impacts associated with emissions from diesel generators at the works compounds required for construction of the Proposed Bowland Section. The assessment also included consideration of the impact of road traffic emissions due to the additional vehicle movements on the local road network during construction. The predicted impacts were assessed against the relevant air quality standards and guidelines for protected designated ecological sites (referred to as critical levels and critical loads).
- 4.7 Relevant to HRA, the Institute of Air Quality Management Guidance (IAQM, May 2020)⁴ requires identification of European designations within 10 km. Three designations are present within 10 km (Bowland Fells SPA, Calf Hill and Crag Woods SAC, North Pennine Dales Meadows SAC).
- 4.8 The UK Air Pollution Information System (APIS)⁵ provides a list of nitrogen sensitive habitats that have been used to scope European designations that might be subject to air quality impacts. In line with the Institute of Air Quality Management Guidance (IAQM, May 2020)⁶ these were used to determine if any European designations were present within 10 km of the proposals that contain nitrogen sensitive habitats.
- 4.9 The following designations are present within 10 km of the north and/or south compounds, along with the relevant nitrogen sensitive habitats:
- Bowland Fells SPA (both compounds / LCC and RVBC):
 - Broad habitat: Dwarf shrub heath
 - Relevant nitrogen critical load class: Northern wet heath: Calluna-dominated wet heath (upland moorland)
 - Calf Hill and Crag Woods SAC (north compound only / LCC): broadleaved deciduous woodland
 - Broad habitat: Old sessile oak woods with Ilex and Blechnum
 - Relevant nitrogen critical load class: Acidophilous Quercus-dominated woodland
 - North Pennine Dales Meadows SAC (south compound only / RVBC): dry grassland, humid grassland, mesophile grassland.
 - Broad habitat: Mountain hay meadows
 - Relevant nitrogen critical load class: Mountain hay meadows

⁴ IAQM 2020. A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.1

⁵ UK Air Pollution Information System. <http://www.apis.ac.uk/>

⁶ IAQM 2020. A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.1

- Broad habitat: *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinia caerulea*)
 - Relevant nitrogen critical load class: Moist and wet oligotrophic grasslands: *Molinia caerulea* meadows

4.10 The predicted nitrogen and acid deposition at these designation sites resulting from diesel generator emissions is summarised in Tables 3 and 4. The results indicate that the predicted deposition rates from diesel generator emissions are all below the relevant criteria (set out in Section 18.4.5 of the ES Air Quality chapter) for identifying where further assessment is required by ecologists (i.e. the Process Contribution (PC) was less than 1 % of the critical load for the European designated sites (PC/CL)). Therefore, the predicted impacts are imperceptible and would be unlikely to result in any significant air quality effects at any of the designated sites identified in the assessment.

Table 3. Maximum estimated nutrient N deposition (kgN/ha-year) resulting from proposed Bowland works.

Ref	Designated Site	Min.Critical Load (CL)	Estimated nutrient N deposition (kgN/ha-year)				
			Existing deposition	PC	PEC	PC/CL (%)	PEC/CL (%)
H17a	North Pennine Dales Meadows SAC	10	26.6	0.045	26.6	0.5	266
H47k	Bowland Fells SPA	10	27.7	0.052	27.8	0.5	278
H21	Calf Hill and Crag Woods SAC	10	29.3	0.017	29.3	0.2	293

Table 4. Maximum estimated acid deposition (kEqH+/ha-year) resulting from proposed Bowland works.

Ref	Site	Critical load (CL) (kEqH+/ha-year)			Estimated acid deposition (kEqH+/ha-year)					
		CLMax S	CLMin N	CLMax N	Existing deposition (N)	Existing deposition (S)	PC (N)	PEC	PC/CL (%)	PEC/CL (%)
H17a	North Pennine Dales Meadows SAC	1.6	0.4	2.10	1.9	0.3	0.006	2.2	0.3	106
H47k	Bowland Fells SPA	0.7	0.6	1.4	2.0	0.4	0.007	2.4	0.5	172
H21	Calf Hill and Crag Woods SAC	2.8	0.4	3.2	2.1	0.3	0.00	2.4	0.1	75

Groundwater Impacts

- 4.11 Where the tunnel is close to the surface, there is potential for water ingress into the decommissioned tunnels which in turn could have an effect on groundwater dependant habitats above the asset. Lateral effects at the surface, should they occur, are expected to extend no further than 200 m (this would be the dewatering zone of influence). The only European designation that the existing tunnel passes beneath or within 200m is the Bowland Fells SPA. In fact it does not come within 1 km of any other European sites.
- 4.12 The potential for dewatering effects on GWDTEs to arise as a result of decommissioning the existing asset are dependent on the construction type and depth of the existing Haweswater Aqueduct (HA) and the geological conditions between the asset and the surface. Therefore a detailed assessment has been undertaken to identify any lengths of the HA where effects on GWDTEs might occur. No section of the existing Bowland tunnel was identified as requiring investigation for potential dewatering effects on GWDTE. The current tunnel section is at a depth of 370 m at its deepest point, with the deeper sections passing beneath the Bowland Fells SPA. The Water Environment assessment (Environmental Statement Chapter 7, Ref: LCC-RVBC-BO-ES-007) confirmed that any water ingress into the decommission tunnel occurring at depth would not impact on surface receptors such as watercourses and GWDTEs. Where the existing tunnel section proposed for decommissioning passes beneath the SPA, it is at sufficient depth that there will be no impact on this SPA.

Species Disturbance

- 4.13 No hen harrier or merlin (the qualifying species of the Bowland Fells SPA) were recorded within or near to the two works areas during the winter bird survey (Environmental Statement Technical Appendix 9A.6, Ref: LCC_RVBC-BO-TA-009-01-06). It is highly unlikely that these species use the works area or land near to them for nesting, and due to the distance from the SPA it is highly unlikely that these areas provide valuable foraging habitat.
- 4.14 Records of a number of known hen harrier winter roost sites within the wider surrounding area near to the Lower Houses Compound have been obtained from the RSPB. It is the view of the RSPB (Bray, Pers comms, November 2020) that the proposed works will not have a negative impact on roosting hen harrier, due to no known roosting locations being present within 500 m of the works and the topography preventing any line of sight between the works and the roost sites. In addition there is no suitable roosting habitat within 500 m of the works. There are no known hen harrier or merlin nest sites that could be impacted by the works and the habitat surrounding the sites is not suitable for nesting by these species. Therefore no disturbance impacts on hen harrier or merlin are predicted.

- 4.15 Breeding lesser black-backed gull is a proposed feature of the Bowland Fells SPA which, having been considered at the public consultation stages as a proposed feature, must be treated as a feature within the SPA process. The nearest notable lesser black-backed gull colony is 10.3 km northwest of the Newton-in-Bowland Compound and 7.6 km southwest of the Lower Houses Compound. During the breeding season lesser black-backed gull were only recorded within the Lower Houses Compound during the April survey visit with 16 individuals within the site. A peak count of 25 individuals were recorded offsite within 500m of the Lower Houses Compound during the breeding bird survey. A peak count of 8 lesser black backed gull were recorded within the Newton-in-Bowland Compound, with a peak count of 42 individuals offsite within 100 m and 100 individuals within 100 to 500 m. It is highly unlikely that lesser black-backed gull nest within 500 m of the site. Due to the very low usage of the compounds and low usage within 500 m of the compounds, as well as the known high tolerance of this species to disturbance, the proposals are highly unlikely to result in any disturbance impacts on breeding lesser black-backed gull. Most of the lesser black backed gull observed were between 100 m and 500 m of the site and there is an abundance of suitable feeding habitat for this species in the wider surrounding area. Very little usage was observed within the footprint of the works. It is therefore highly unlikely that the works will result in a loss of supporting habitat for this species. Furthermore, the noisiest of works associated with the drive portal construction (blasting works) is due to be undertaken over a five month period commencing in July and ending in November. Almost all of this activity would therefore be outside of the nesting period of the species associated with the SPA.
- 4.16 It is therefore considered that the proposed works would not have any impact on breeding hen harrier, merlin or lesser black-backed gull associated with the Bowland Fells SPA.
- 4.17 No qualifying species of the Morecambe Bay & Duddon Estuary SPA were recorded within any of the survey areas during the 2019/2020 winter bird survey.
- 4.18 The only assemblage species recorded within or near to the works areas during the winter bird survey included curlew and lesser black-backed gull, with a peak count of 3 curlew recorded in the northern area and 114 lesser black backed gulls recorded in the southern area in March (Ref: LCC_RVBC-BO-TA-009-01-06).
- 4.19 Due to the distance between the works compounds and the SPA designation, it is highly unlikely that these birds formed part of the Morecambe Bay & Duddon Estuary SPA waterbird assemblage.
- 4.20 Three qualifying species of the Morecambe Bay Ramsar were recorded within the survey areas during the 2019/2020 winter bird survey (Ref: LCC_RVBC-BO-TA-009-01-06). These included curlew (peak count of 3 individuals recorded in northern area in March), lapwing (peak count of 215 individuals recorded 100 m from northern area in January) and lesser black-backed gull (peak count of 114 individuals recorded in southern area in March). These peak counts equate to <0.01% curlew, 1.3% lapwing and 0.28% lesser black-backed gull qualifying populations.

- 4.21 Due to the distance between the works compounds and the Ramsar designation, it is highly unlikely that these birds formed part of the Morecambe Bay Ramsar qualifying populations or waterbird assemblage and it is therefore highly unlikely that there would be any impact on this protected site.
- 4.22 Leighton Moss SPA is designated for bittern, a species that relies upon extensive wetlands. As there is no suitable habitat for bittern within influencing distance of the proposed above ground works there would be no impact on this designation.
- 4.23 Leighton Moss Ramsar is designated for marsh harrier, shoveler and water rail. Marsh harrier is not an upland bird species and none were recorded during wintering or breeding bird surveys. Shoveler and water rail are species that rely upon wetlands and open water. As there is no suitable habitat for marsh harrier, shoveler and water rail within influencing distance of the proposed above ground works there would be no impact on this designation.

Table 5 - Appropriate Assessment Summary Table

Designated Site (inc. distance from Project)	Impact & Pathway (TR)	Assessment	Adverse Effect on Integrity?
Bowland Fells SPA (UK9005151)	<u>Construction and Operation</u> Loss or degradation of habitat and species from waterborne pollution during the construction and operational stages.	There are no hydrological linkages between the above ground works and the Bowland Fells SPA. The distance and topography between the project and the SPA (>2km away and uphill of both compounds) means that waterborne pollution could not reach the SPA.	No Due to the distance from the Bowland Fells SPA and the lack of hydrological linkages, there would be no effect on the SPA. There would therefore be no adverse effect on the integrity of this SPA.
(2.6km north of southern site compound & laydown area)	<u>Construction</u> Loss or degradation of habitats or species associated with the SPA as a result of airborne pollution travelling to designations during the construction phase of the development.	The SPA lies within the 10km air quality assessment zone of both compounds, and the following nitrogen sensitive habitats form part of the designation: bog, heath, grassland, inland rock and scree. Generators will be used at the compounds during the construction period. This is the only source of potentially significant air quality effects resulting from the proposals. However the assessment confirmed no perceivable impacts at the SPA would result from the proposals.	No There would be no likely significant effects on the Bowland Fells SPA resulting from airborne pollution during the construction phase. There would therefore be no adverse effect on the integrity of this SPA

Designated Site (inc. distance from Project)	Impact & Pathway (TR)	Assessment	Adverse Effect on Integrity?
	<u>Decommissioning</u> Loss or degradation of habitats or species associated with the SPA as a result of changes to groundwater during decommissioning of the existing asset.	Where the existing tunnel section proposed for decommissioning passes beneath the SPA, it is at sufficient depth that there will be no potential for impacts on ground water dependant habitats within the SPA.	No The tunnel section will pass below the Bowland Fells at a sufficient depth that there would be no impact to groundwater habitats associated with the SPA. There would therefore be no adverse effect on the integrity of this SPA
	<u>Construction and Operation</u> Disturbance to species associated with the SPA or loss of supporting habitat for these species.	It is highly unlikely that hen harrier or merlin use the works area or land near to them for nesting, and due to the distance from the SPA it is highly unlikely that these areas provide valuable foraging habitat. It is the view of the RSPB that the proposed works will not negatively impact roosting hen harrier, due to no known or suitable roosting locations being present within 500m of the works and the topography preventing any line of sight between the works and the roost sites. Due to low use of the compounds and land within 500m by lesser black-backed gull, as well as the known high tolerance of this species to disturbance the proposals are highly unlikely to result in habitat loss or disturbance impacts on breeding lesser black-backed gull. It is therefore considered that the proposed works would not have any impact on breeding hen harrier, merlin or lesser black-backed gull associated with the Bowland Fells SPA.	No Due to the distance from the Bowland Fells SPA, the habitats present at the works area and the timing of the works, there will be no disturbance or habitat loss impacts on the qualifying species. There would therefore be no adverse effect on the integrity of this SPA

Designated Site (inc. distance from Project)	Impact & Pathway (TR)	Assessment	Adverse Effect on Integrity?
<p>Morecambe Bay & Duddon Estuary SPA (UK9020326)</p> <p>(15.6km west of northern area)</p>	<p><u>Construction and Operation</u></p> <p>Disturbance to species associated with the SPA or loss of supporting habitat for these species.</p>	<p>No qualifying species of the Morecambe Bay & Duddon Estuary SPA were recorded within any of the survey areas during the 2019/2020 winter bird survey.</p> <p>The only assemblage species recorded within or near to the works areas during the winter bird survey included curlew and lesser black-backed gull, with a peak count of 3 curlew recorded in the northern area and 114 lesser black backed gulls recorded in the southern area in March.</p> <p>Due to the distance involved, it is highly unlikely that these birds formed part of the Morecambe Bay & Duddon Estuary SPA waterbird assemblage.</p>	<p>No</p> <p>Due to the distance from the Morecambe Bay & Duddon Estuary SPA and the lack of any qualifying species recorded during the winter bird survey, it is highly unlikely there would be any impact on this SPA.</p> <p>There would therefore be no adverse effect on the integrity of this SPA</p>
<p>Morecambe Bay Ramsar (UK11045)</p> <p>(15.6km west of northern area)</p>	<p><u>Construction and Operation</u></p> <p>Disturbance to species associated with the Ramsar or loss of supporting habitat for these species.</p>	<p>Three qualifying species of the Morecambe Bay Ramsar were recorded within the survey areas during the 2019/2020 winter bird survey including peak counts of 3 curlew, 215 lapwing and 114 lesser black-backed gull.</p> <p>Due to the distance involved, it is highly unlikely that these birds formed part of the Morecambe Bay Ramsar qualifying populations or waterbird assemblage and it is therefore highly unlikely that there would be any impact on this protected site.</p>	<p>No</p> <p>Due to the distance from the Morecambe Bay Ramsar and low numbers of qualifying species recorded during the winter bird survey, it is highly unlikely there would be any impact on this Ramsar site.</p> <p>There would therefore be no adverse effect on the integrity of this Ramsar site.</p>

Designated Site (inc. distance from Project)	Impact & Pathway (TR)	Assessment	Adverse Effect on Integrity?
<p>Leighton Moss SPA ((UK9005091) (17.2km northwest of northern section)</p>	<p><u>Construction and Operation</u></p> <p>Disturbance to species associated with the SPA or loss of supporting habitat for these species.</p>	<p>There is no suitable habitat for bittern within influencing distance of the proposed works.</p>	<p>No</p> <p>Due to the distance from the SPA and the lack of any suitable habitat for bittern within influencing distance, there would not be any impacts on species associated with this protected site.</p> <p>There would therefore be no adverse effect on the integrity of this SPA.</p>
<p>Leighton Moss Ramsar (UK11035) (17.2km northwest of northern section)</p>	<p><u>Construction and Operation</u></p> <p>Disturbance to species associated with the Ramsar or loss of supporting habitat for these species.</p>	<p>The proposed works are highly unlikely to have any impact on marsh harrier, shoveler or water rail. The works are considered too distant from the Ramsar and without suitable habitat to have any impacts on species associated with this site.</p>	<p>No</p> <p>Due to the distance from the Ramsar and lack of suitable habitat there are highly unlikely to be any impacts on species associated with this site.</p> <p>There would therefore be no adverse effect on the integrity of this Ramsar site.</p>

Designated Site (inc. distance from Project)	Impact & Pathway (TR)	Assessment	Adverse Effect on Integrity?
<p>Calf Hill & Crag Woods SAC (UK0030106)</p> <p>(9.1km southwest of northern area)</p>	<p><u>Construction</u></p> <p>Loss or degradation of habitats or species associated with the SAC as a result of airborne pollution travelling to designations during the construction phase of the development</p>	<p>The SAC lies within the 10km air quality assessment zone of the northern compound and the following nitrogen sensitive habitats form part of the designation: bog, heath, grassland, inland rock and scree.</p> <p>Generators will be used at the compounds during the construction period. This is the only source of potentially significant air quality effects resulting from the proposals. However the assessment confirmed no perceivable impacts at the SAC would result from the proposals.</p>	<p>No</p> <p>There would be no likely significant effect on the Calf Hill and Crag Woods SAC resulting from airborne pollution during the construction phase.</p> <p>There would therefore be no adverse effect on the integrity of this SAC</p>
<p>North Pennine Dales Meadows SAC (UK0014775)</p> <p>(3.1km northeast of southern area)</p>	<p><u>Construction and Operation</u></p> <p>Loss or degradation of habitat and species from waterborne pollution during the construction and operational stages.</p>	<p>There are no hydrological linkages between the above ground works and the North Pennine Dales Meadows SAC. The distance and topography between the project and the SAC (>3km away and uphill of southern compound) means that waterborne pollution could not reach the SAC.</p>	<p>No</p> <p>Due to the distance from the North Pennine Dales Meadows SAC and the lack of hydrological linkages, there would be no effect on the SAC.</p> <p>There would therefore be no adverse effect on the integrity of this SAC.</p>

Designated Site (inc. distance from Project)	Impact & Pathway (TR)	Assessment	Adverse Effect on Integrity?
	<p><u>Construction</u></p> <p>Loss or degradation of habitats or species associated with the SAC as a result of airborne pollution travelling to designations during the construction phase of the development</p>	<p>The SAC lies within the 10km air quality assessment zone of the southern compound and the following nitrogen sensitive habitats form part of the designation: dry grassland, humid grassland, mesophile grassland.</p> <p>Generators will be used at the compounds during the construction period. This is the only source of potentially significant air quality effects resulting from the proposals. However the assessment confirmed no perceivable impacts at the SAC would result from the proposals.</p>	<p>No</p> <p>There would be no likely significant effect on the North Pennine Dales Meadows SAC resulting from airborne pollution during the construction phase.</p> <p>There would therefore be no adverse effect on the integrity of this SAC.</p>

In-Combination Assessment

- 4.24 Another tunnel section is proposed to be replaced as part of the HARP project within 1km of the Bowland section at its closest point, known as the Proposed Marl Hill Section which is subject to a separate planning application. On a precautionary basis the air quality impacts for the Bowland and the Marl Hill sections have been modelled together to assess the combined impact on the North Pennine Dales Meadow SAC and the Bowland Fells SPA. Calf Hill & Cragg Wood SAC is excluded from this combined assessment as it is on the north side of the Bowland Fells and not within the influence of the Marl Hill section. The results are summarised in Tables 6 and 7 and show that even when combined, the PC does not exceed 1 % of the critical load for the European designated sites.

Table 6. Maximum estimated nutrient N deposition (kgN/ha-year) resulting from proposed Bowland and Marl Hill works combined.

Ref	Designated Site	Min.Critical Load (CL)	Estimated nutrient N deposition (kgN/ha-year)				
			Existing deposition	PC	PEC	PC/CL (%)	PEC/CL (%)
H17a	North Pennine Dales Meadows SAC	10	26.6	0.084	26.7	0.8	267
H47k	Bowland Fells SPA	10	27.7	0.079	27.8	0.8	278

Table 7. Maximum estimated acid deposition (kEqH+/ha-year) resulting from proposed Bowland and Marl Hill works combined.

Ref	Site	Critical load (CL) (kEqH+/ha-year)			Estimated acid deposition (kEqH+/ha-year)					
		CLMax xS	CLMin N	CLMax N	Existing deposition (N)	Existing deposition (S)	PC (N)	PEC	PC/CL (%)	PEC/CL (%)
H17a	North Pennine Dales Meadows SAC	1.6	0.4	2.10	1.9	0.3	0.011	2.2	0.5	107
H47k	Bowland Fells SPA	0.7	0.6	1.4	2.0	0.4	0.011	2.4	0.8	172

- 4.25 The Bowland Fells SPA and North Pennine Dales Meadows SAC are in a rural location where development pressures are low and no other plans or projects were identified that could have in-combination air quality effects on these designations. Therefore, the predicted in-combination impacts remain imperceptible and would be unlikely to result in any significant air quality effects at any of the designated sites identified in the assessment.

- 4.26 The permanent storage of surplus materials generated by the Project within Waddington Fell Quarry is subject to a separate planning application for which the quarry is responsible. Any HRA considerations of the material storage will be dealt with in this separate application. As there are no predicted impacts from the Project on European sites there will be no significant impact in-combination with the proposals at Waddington Fell Quarry.
- 4.27 Other than air quality effects which have been assessed and ruled out, the predicted impacts from the proposed Bowland section on European designated sites are nugatory and there is no other potential for in-combination effects to arise with other projects or plans.

5.0 Conclusions

- 5.1 This HRA has been carried out to assess whether the Proposed Bowland Section, forming part of the wider HARP scheme could result in a significant adverse effect on the integrity of any European site.
- 5.2 On a precautionary basis, the following European sites within 20 km of the Project were scoped into the Screening Assessment to identify whether there was a risk or possibility of a significant effect occurring:
- Bowland Fells SPA
 - Morecambe Bay and Duddon Estuary SPA
 - Morecambe Bay SAC
 - Morecambe Bay Ramsar
 - Leighton Moss SPA
 - Leighton Moss Ramsar
 - Calf Hill & Crag Woods SAC
 - Ingleborough Complex SAC
 - North Pennine Dales Meadows SAC
 - Morecambe Bay Pavements SAC
- 5.3 The following potential impact pathways were identified for the European sites:
- Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of waterborne pollution travelling to designations via hydrological linkages during the construction and operational phases of the development.
 - Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of airborne pollution travelling to designations during the construction phase of the development.
 - Loss or degradation of habitats or species associated with the SPA / SAC / Ramsar as a result of changes to groundwater as a result of the development including decommissioning of the existing asset.
 - Disturbance to species associated with the SPA / Ramsar or loss of supporting habitat for these species during the construction and operational phases of the development.
- 5.4 The Screening Assessment determined that there was a risk of a significant effect for one or more of each of the above impact pathways for each of the identified European sites with the exception of the Ingleborough complex SAC and the Morecambe Bay Pavements SAC. The remaining designations were then taken forward for Appropriate Assessment to determine if there could be an adverse effect on integrity of any of the sites.
- 5.5 The Appropriate Assessment concludes that, without mitigation, there will be no adverse effect on the integrity of any European sites alone or in-combination with other projects or plans. The HRA can therefore be concluded at this stage.

APPENDIX A: Attributes of European Sites

European Site Conservation Objectives for Bowland Fells Special Protection Area and potential Special Protection Area Site Code: UK9005151



With regard to the SPA and potential SPA, and the individual species and/or assemblage of species for which the site has been or may be classified (the 'Qualifying Features' including the 'Additional Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying Supplementary Advice document (where available), which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A082 *Circus cyaneus*; Hen harrier (Breeding)

A098 *Falco columbarius*; Merlin (Breeding)

Additional Qualifying Features*

A183. *Larus fuscus*; Lesser black-backed gull (Breeding)

*Government has undertaken public consultation on the scientific case for the classification of these additional features as part of this Special Protection Area (SPA).

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

This is a potential Special Protection Area (pSPA)

This site is also a pSPA because Government has previously undertaken a [public consultation on the scientific case for the classification of breeding lesser black-backed gull](#) as an additional qualifying feature of this Special Protection Area (SPA). As a matter of Government policy, potential SPAs and their features are treated as if they are formally classified. The provisions of the Habitats Regulations therefore apply to them (see above).

Publication date: 21 February 2019 (version 4). This document updates and replaces an earlier version dated 13 July 2018 to reflect the consolidation of the Habitats Regulations in 2017.

EC Directive 2009/147/EC on the Conservation of Wild Birds Special Protection Area (SPA)

Name: Bowland Fells

Unitary Authority/County: Lancaster, Ribble Valley, Wyre, Lancashire.

Consultation proposal: Bowland Fells is classified as a Special Protection Area because of its importance for the Annex I upland breeding birds hen harrier and merlin. It also supports an internationally important population of breeding lesser black-backed gulls which is proposed as an additional feature of the site. The SPA boundary is coincident with the boundary of Bowland Fells SSSI. For details of the SPA boundary see map.

Site description: The Bowland Fells SPA encompasses the main upland block within the area of Lancashire known as the Forest of Bowland. This is an outlier of the Pennine Range situated in the north of the county and to the east of the M6 motorway.

Most of this land, stretching from Clougha and Whitray Fell in the north to Parlick in the south, is over 250 m OD and rises sharply to a stream dissected plateau with the highest point being Ward's Stone at 561 m. The underlying rock is Millstone Grit beneath which lies Carboniferous Limestone. These extensive upland fells support the largest expanse of blanket bog and heather moorland in Lancashire and provide suitable habitat for a diverse upland breeding bird community which includes the Annex I species hen harrier and merlin for which the SPA is classified. The site also qualifies as it supports more than 1% of the biogeographic population of breeding lesser black-backed gull.

The most extensive plant communities within the site are dry heather dominated heathland, generally found on the steeper slopes, and heather *Calluna vulgaris* and cotton grass *Eriophorum vaginatum* dominated blanket bog which covers the tops of the ridges and shallow slopes.

Size of SPA: 16,002.3 ha

Qualifying species: The site qualifies under **article 4.1** of the Directive (2009/147/EC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Species	Count (period)	% of population	Interest type
Hen harrier <i>Circus cyaneus</i>	12 pairs 1986-1990	2.4% (GB population)	Annex I
Merlin <i>Falco columbarius</i>	21 pairs 1986-1990	3.2% (GB population)	Annex I

Proposed new interest: The site qualifies under **article 4.2** of the Directive (2009/147/EC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Species	Count (period)	% of population	Interest type
Lesser black-backed gull <i>Larus fuscus graellsii</i>	4575 pairs 2009-2012 ¹	2.5% (biogeographic population) ²	Migratory

¹ Data from: i) Sowter, D. J., 2009-2011. Tarnbrook Fell gullery reports, unpublished, and ii) Coyle, S. P., 2012. The Tarnbrook Fell gullery report 2012 and Langden Head gullery report 2012, unpublished.

² Biogeographic reference population cited in Mundkur T., & Nagy S. eds 2012. Waterbird Population Estimates - Fifth edition. Wetlands International. Wageningen, The Netherlands.

European Site Conservation Objectives for Morecambe Bay & Duddon Estuary Special Protection Area

Site Code: UK9020326



With regard to this SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying Conservation Advice document which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features

- A026 *Egretta garzetta*; Little egret (Non-breeding)
- A038 *Cygnus cygnus*; Whooper swan (Non-breeding)
- A040 *Anser brachyrhynchus*; Pink-footed goose (Non-breeding)
- A048 *Tadorna tadorna*; Common shelduck (Non-breeding)
- A054 *Anas acuta*; Northern pintail (Non-breeding)
- A130 *Haematopus ostralegus*; Eurasian oystercatcher (Non-breeding)
- A137 *Charadrius hiaticula*; Ringed plover (Non-breeding)
- A140 *Pluvialis apricaria*; European golden plover (Non-breeding)
- A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
- A143 *Calidris canutus*; Red knot (Non-breeding)
- A144 *Calidris alba*; Sanderling (Non-breeding)
- A149 *Calidris alpina alpina*; Dunlin (Non-breeding)

Contd/

A151 *Philomachus pugnax*; Ruff (Non-breeding)
A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding)
A160 *Numenius arquata*; Eurasian curlew (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A169 *Arenaria interpres*; Ruddy turnstone (Non-breeding)
A176 *Larus melanocephalus*; Mediterranean gull (Non-breeding)
A183 *Larus fuscus*; Lesser black-backed gull (Non-breeding)
A183 *Larus fuscus*; Lesser black-backed gull (Breeding)
A184 *Larus argentatus*; Herring gull (Breeding)
A191 *Sterna sandvicensis*; Sandwich tern (Breeding)
A193 *Sterna hirundo*; Common tern (Breeding)
A195 *Sterna albifrons*; Little tern (Breeding)

Waterbird assemblage

Seabird assemblage

This is a European Marine Site

This SPA is a part of the Morecambe Bay European Marine Site ('EMS'). These Conservation Objectives should be used in conjunction with the Conservation Advice document for the EMS. Natural England's formal Conservation Advice for European Marine Sites can be found via [GOV.UK](https://www.gov.uk).

This is a new combined site

This SPA replaces two individual sites – Morecambe Bay SPA (UK9005081) and Duddon Estuary SPA (UK9005031).

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 21 February 2019 (version 6). This document updates and replaces an earlier version dated 7 December 2017 to reflect the consolidation of the Habitats Regulations in 2017.

Morecambe Bay and Duddon Estuary Site Citation

EC Directive 79/409 on the Conservation of Wild Birds

Special Protection Area (SPA)

Name: *Morecambe Bay and Duddon Estuary Special Protection Area*

Counties/Unitary Authorities: *Cumbria, Lancashire*

Boundary of the SPA:

The landward boundary of the SPA includes all of the intertidal and terrestrial areas covered by the former Morecambe Bay SPA and Duddon Estuary SPA. It includes areas of adjoining terrestrial coastal habitat at North and South Walney and at Haverigg Point on the Duddon Estuary and the lagoons at South Walney; Cavendish Dock, Barrow and Hodbarrow, Haverigg.

Where the landward boundary extends from Kirksanton Haws to Drigg Dunes, including the Ravenglass Estuary and the west side of Walney Island, it follows Mean High Water.

From Rossall Point to a defined point in central Morecambe Bay (54° 5.732' N 3° 1.325' W) the seaward boundary follows Mean Low Water. From central Morecambe Bay the seaward boundary runs offshore around Walney Island and along the south west Cumbria Coast, reaching a maximum of 8 km offshore opposite Kirksanton Haws, meeting the coast again at Drigg Dunes.

Morecambe Bay and Duddon Estuary SPA supersedes the original Morecambe Bay SPA and Duddon Estuary SPA.

Size of SPA: The SPA covers an area of 66,899.97 ha.

Site description:

The SPA extends between Rossall Point in Lancashire and Drigg Dunes in Cumbria. The site includes the former Morecambe Bay SPA and Duddon Estuary SPA and an extension to include the Ravenglass Estuary and intervening coast and the shallow offshore area off south west Cumbria coast.

Morecambe Bay is the second largest embayment in Britain after The Wash, at over 310 km², and has four estuaries – the Wyre, Lune, Kent and Leven. It contains the largest continuous area of intertidal mudflats and sandflats in the UK which supports a variety of infaunal communities including cockle beds. Morecambe Bay supports a wide range of other habitats including large areas of saltmarsh and transitional habitats as well as sand dune systems and coastal lagoons. Within the Bay there are areas of stony reef (known locally as scars or skears) which also support blue mussel beds and honeycomb worm *Sabellaria alveolata* reefs. Extensive eelgrass beds are present around Foulney Island and in the south Walney Channel, the only examples in the North West of England.

The Duddon and Ravenglass Estuaries support saltmarsh, intertidal mud and sand communities and sand dune systems with small areas of stony reef. The intermediate coast comprises extensive shingle and sand beaches.

The parts of the SPA away from the coast are sandy and shallow, mostly less than 15 metres deep.

Qualifying species:

SPA site selection guidelines have been applied to the most up to date information for the site. However, this contemporary data reveals that some species are no longer present in qualifying

numbers (either through declines or because the relevant threshold has increased). It is not clear whether anthropogenic influences have affected the populations at the site. Defra policy indicates that in these circumstances the feature should be retained until such time as the reasons for the reduction in population can be established. Natural England therefore considers that these species should be retained on the citation, and the level of ambition set out in the conservation objectives for these species maintained, until such time as we have evidence to support the conclusion that declines are a result of natural processes and that the SPA is no longer suitable for these species.

The site qualifies under **Article 4.1** of the Directive (2009/147/EC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Species	Season	Count (Period)	% of population
Whooper swan <i>Cygnus Cygnus</i>	Non-breeding	113 individuals (2009/10 – 2013/14) ¹	1.0% of GB population
Little egret <i>Egretta garzetta</i>	Non-breeding	134 individuals (2009/10 – 2013/14) ¹	3.0% of GB population
European golden plover <i>Pluvialis apricaria</i>	Non-breeding	1,900 individuals (Morecambe Bay SPA citation value 1991) ²	1.0% of GB population (1991)
Bar-tailed Godwit <i>Limosa lapponica</i>	Non-breeding	3,046 individuals (2009/10 – 2013/14) ¹	8.0% of GB population
Ruff <i>Calidris pugnax</i>	Non-breeding	8 individuals (2009/10 – 2013/14) ¹	1.0% of GB population
Mediterranean gull <i>Larus melancephalus</i>	Non-breeding	18 individuals (2009/10 – 2013/14) ¹	1.0% of GB population
Little tern <i>Sternula albifrons</i>	Breeding	84 individuals (2010 – 2014) ³	2.2% of GB population
Sandwich tern <i>Sterna sandvicensis</i>	Breeding	1,608 individuals (1988 - 1992) ⁴	5.7% of GB population (1992)
Common tern <i>Sterna hirundo</i>	Breeding	570 individuals (Morecambe Bay SPA citation value 1991) ⁵	2.0% of GB population (1991)

The site qualifies under **Article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Species	Season	Count (Period)	% of population
Pink-footed goose <i>Anser brachyrhynchus</i>	Non-breeding	15,648 individuals (2009/10 – 2013/14) ⁶	4.5% of biogeographic population
Common shelduck <i>Tadorna tadorna</i>	Non-breeding	5,878 individuals (2009/10 – 2013/14) ¹	2.0% of biogeographic population
Northern Pintail <i>Anas acuta</i>	Non-breeding	2,498 individuals (2009/10 – 2013/14) ¹	4.2% of biogeographic population
Eurasian oystercatcher <i>Haematopus ostralegus</i>	Non-breeding	55,888 individuals (2009/10 – 2013/14) ¹	6.8% of biogeographic population
Grey plover <i>Pluvialis squatarola</i>	Non-breeding	2,000 individuals (Morecambe Bay SPA citation value 1991) ⁷	1.0% of biogeographic population (1991)

¹ Data from Wetland Bird Survey

² Current five year peak mean (2009/10 – 2013/14) = 3,494 (0.9% GB population)

³ Data from RSPB

⁴ Summed data from SMP relating to period of original classification for Morecambe Bay SPA and Duddon Estuary SPA (1988 – 1992). Current five year peak mean (2010-2014) = 40 pairs (0.4% GB population).

⁵ Current five year peak mean (2010-2014) = 47 pairs (0.5% GB population).

⁶ Data from Wetland Bird Survey and Icelandic-breeding Goose Census.

⁷ Current five year peak mean (2009/10 – 2013/14) = 1,013 (0.4% biogeographic population).

Species	Season	Count (Period)	% of population
Common ringed plover <i>Charadrius hiaticula</i>	Non-breeding	1,049 individuals (2009/10 – 2013/14) ¹	1.4% of biogeographic population
Eurasian curlew <i>Numenius arquata</i>	Non-breeding	12,209 individuals (2009/10 – 2013/14) ¹	1.5% of biogeographic population
Black-tailed godwit <i>Limosa limosa</i>	Non-breeding	2,413 individuals (2009/10 – 2013/14) ¹	4.0% of biogeographic population
Ruddy turnstone <i>Arenaria interpres</i>	Non-breeding	1,359 individuals (2009/10 – 2013/14) ¹	1.0% of biogeographic population
Red knot <i>Calidris canutus</i>	Non-breeding	32,739 individuals (2009/10 – 2013/14) ¹	7.3% of biogeographic population
Sanderling <i>Calidris alba</i>	Non-breeding	3,600 individuals (Morecambe Bay SPA citation value 1991) ⁸	3.0% of biogeographic population (1991)
Dunlin <i>Calidris alpina alpina</i>	Non-breeding	26,982 individuals (2009/10 – 2013/14) ¹	2.0% of biogeographic population
Common redshank <i>Tringa totanus</i>	Non-breeding	11,133 individuals (2009/10 – 2013/14) ¹	4.6% of biogeographic population
Lesser black-backed gull <i>Larus fuscus</i>	Non-breeding	9,450 individuals (2009/10 – 2013/14) ¹	1.7% of biogeographic population
Lesser black-backed gull <i>Larus fuscus graellsii</i>	Breeding	9,720 individuals (2011-2015) ⁹	2.7% of biogeographic population
European herring gull <i>Larus argentatus argentatus</i>	Breeding	20,000 individuals (Morecambe Bay SPA citation value 1991) ¹⁰	1.0% of biogeographic population (1991)

Assemblage qualification:

The site qualifies under **Article 4.2** of the Directive (2009/147/EC) as it used regularly by over 20,000 seabirds in any season:

At time of the 1997 citation of Morecambe Bay SPA, the area supported 40,672 individual seabirds including: herring gulls, lesser black-backed gulls, sandwich terns, common terns, and little terns.

The site qualifies under **Article 4.2** of the Directive (2009/147/EC) as it used regularly by over 20,000 waterbirds in any season:

During the period 2009/10 – 2013/14, the site held a five year peak mean value of 266,751 individual birds. The main components of the assemblage include all of the qualifying features listed above, as well as an additional 19 species present in numbers exceeding 1% of the GB total and / or exceeding 2,000 individuals: great white egret, Eurasian spoonbill, light-bellied brent goose (Nearctic origin), Eurasian wigeon, Eurasian teal, green-winged teal, mallard, ring-necked duck, common eider (non-breeding), common goldeneye, red-breasted merganser, great cormorant, northern lapwing, little stint, spotted redshank, common greenshank, black-headed gull, common (mew) gull and European herring gull (non-breeding).

Principal bird data sources:

Colony counts from JNCC Seabird Monitoring Programme and contributed by colony managers: RSPB (Hodbarrow) and Cumbria Wildlife Trust (Morecambe Bay). Non-breeding bird data from Wetland Bird Survey (WeBS) and WWT's Icelandic-breeding Goose Census (¹¹Mitchell 2014).

⁸ Current five year peak mean (2009/10 – 2013/14) = 849 (0.7% biogeographic population).

⁹ Data from Seabird Monitoring Programme database, RSPB and Cumbria Wildlife Trust

¹⁰ Current five year peak mean (2011-2015) = 3,192 individuals (0.5% biogeographic population).

¹¹ Mitchell, C. (2014). Status and distribution of Icelandic-breeding geese: results of the 2013 international census. Wildfowl & Wetlands Trust Report, Slimbridge. 20pp.

European Site Conservation Objectives for Morecambe Bay Special Area of Conservation

Site Code: UK0013027



With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H1110. Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks

H1130. Estuaries

H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats

H1150. Coastal lagoons*

H1160. Large shallow inlets and bays

H1170. Reefs

H1220. Perennial vegetation of stony banks; Coastal shingle vegetation outside the reach of waves

H1310. *Salicornia* and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand

H1330. Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

H2110. Embryonic shifting dunes

H2120. Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); Shifting dunes with marram

H2130. Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland*

H2150. Atlantic decalcified fixed dunes (*Calluno-Ulicetetea*); Coastal dune heathland*

H2170. Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*); Dunes with creeping willow

H2190. Humid dune slacks

S1166. *Triturus cristatus*; Great crested newt

* denotes a priority natural habitat or species

This is a European Marine Site

This site is a part of the Morecambe Bay European Marine Site. These Conservation Objectives should be used in conjunction with the Conservation Advice document for the EMS. Natural England's formal Conservation Advice for European Marine Sites can be found via [GOV.UK](https://www.gov.uk).

* Priority natural habitats or species

Some of the natural habitats and species for which UK SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Habitats Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the "Habitats Regulations"). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Morecambe Bay
Unitary Authority/County:	Cumbria, Lancashire
SAC status:	Designated on 1 April 2005
Grid reference:	SD371697
SAC EU code:	UK0013027
Area (ha):	61506.22
Component SSSI:	Duddon Estuary SSSI, Lune Estuary SSSI, Morecambe Bay SSSI, Roudsea Wood and Mosses SSSI, South Walney and Piel Channel Flats SSSI, Wyre Estuary SSSI

Site description:

Morecambe Bay is a large, very shallow, predominantly sandy bay at the confluence of four principal estuaries, the Leven, Kent, Lune and Wyre. The Duddon Estuary is within the SAC but north of the bay itself, although directly connected to it by Walney Channel. At low tide vast areas of intertidal sandflats are exposed, with small areas of mudflat, particularly in the upper reaches of the associated estuaries. The sediments of the bay are mobile and support a range of community types, from those typical of open coasts (mobile, well-sorted fine sands), grading through sheltered sandy sediments to low-salinity sands and muds in the upper reaches. Apart from the areas of intertidal flats and subtidal sandbanks, Morecambe Bay supports exceptionally large beds of mussels *Mytilus edulis* on exposed „scars“ of boulder and cobble, and small areas of reefs with fucoid algal communities. Of particular note is the rich community of sponges and other associated fauna on tide-swept pebbles and cobbles at the southern end of Walney Channel.

Extensive saltmarshes and glasswort *Salicornia* spp. beds are present in the Lune estuary, contrasting with the fringing saltmarshes and more open intertidal flats of the Leven and Kent estuaries. Most of the saltmarshes are grazed, a characteristic feature of north-west England. In the upper levels of the saltmarshes there are still important transitions from saltmarsh to freshwater and grassland vegetation.

Walney Island is a barrier island fringed by shingle with a partial sand covering. Two areas of exposed vegetated shingle occur at the extremes of the barrier. The southern area has been highly modified by eutrophication from a large gull colony, resulting in communities that are unusually species-rich for pioneer shingle vegetation. Perennial rye-grass *Lolium perenne*, common chickweed *Stellaria media* and biting stonecrop *Sedum acre* are constant elements, with dove“s-foot crane“s-bill *Geranium molle* an unusual and important feature.

Shifting dune vegetation forms a major component of the active sand dune systems at the entrance to Morecambe Bay on Walney Island and the Duddon Estuary at Sandscale Haws. Sandscale supports a mosaic of shifting communities, which form a continuous block around the seaward edge of this site. There are transitions to embryonic shifting dunes. The shingle spits at either end of Walney Island support dune systems at South End and North End Haws. Species associated with these shifting dunes include sea holly *Eryngium maritimum*, sea spurge *Euphorbia paralias*, Portland spurge *Euphorbia portlandica* and sea bindweed *Calystegia soldanella*. Sandscale supports the largest area of calcareous fixed dunes in Cumbria, which contrast with the acidic dunes at the adjacent North End Haws. South End

Haws supports a smaller area of fixed dunes. The fixed dunes support a rich plant diversity including wild pansy *Viola tricolor*, lady's bedstraw *Galium verum*, common restharrow *Ononis repens* and the uncommon dune fescue *Vulpia membranacea* and dune helleborine *Epipactis dunensis*. Dune slacks are particularly well-represented at Sandscale, where they support several uncommon species including marsh helleborine *Epipactis palustris*, dune helleborine and coralroot orchid *Corallorhiza trifida* occur. Sandscale contains both permanent and ephemeral waterbodies and man-made scrapes supporting breeding colonies of great crested newts *Triturus cristatus*. The newts forage widely over the foreshore, dunes, dune-heath and scrub.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Atlantic decalcified fixed dunes (*Calluno-Ulicetea*). (Coastal dune heathland)*
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Coastal lagoons*
- Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*). (Dunes with creeping willow)
- Embryonic shifting dunes
- Estuaries
- Fixed dunes with herbaceous vegetation ("grey dunes"). (Dune grassland)*
- Humid dune slacks
- Large shallow inlets and bays
- Mudflats and sandflats not covered by seawater at low tide. (Intertidal mudflats and sandflats)
- Perennial vegetation of stony banks. (Coastal shingle vegetation outside the reach of waves)
- Reefs
- *Salicornia* and other annuals colonising mud and sand. (Glasswort and other annuals colonising mud and sand)
- Sandbanks which are slightly covered by sea water all the time. (Subtidal sandbanks)
- Shifting dunes along the shoreline with *Ammophila arenaria*. ("White dunes")

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Great crested newt *Triturus cristatus*

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.

Register reference number: UK0013027

Date of registration: 14 June 2005

Signed: *Trevor Salmon*

On behalf of the Secretary of State for Environment, Food and Rural Affairs

des. 04.10.96.

RAMSAR INFORMATION SHEET

FOR WETLANDS OF INTERNATIONAL IMPORTANCE

Site reference number 7UK104
 1 **Compilation date** Sept 1999
 2 **Country** UK (England)
 3 **Name of wetland** Morecambe Bay
 4 **Site centre location:** Latitude: 54 07 19 N Longitude: 02 57 21 W
 5 **Altitude** Not being submitted 0 (coast)
 6 **Area (ha)** 37404.6

7 Overview

Morecambe Bay lies between the coasts of South Cumbria and Lancashire, and represents the largest continuous intertidal area in Britain. Morecambe Bay comprises the estuaries of five rivers and the accretion of mudflats behind Walney Island. The area is of intertidal mud and sandflats, with associated saltmarshes, shingle beaches and other coastal habitats. It is a component in the chain of west coast estuaries of outstanding importance for passage and overwintering waterfowl (supporting the third largest number of wintering waterfowl in Britain), and breeding waterfowl, gulls and terns.

8 **Wetland type** Man-made wetland, Marine/coastal wetland

Code	Name	% Area
B	Marine beds (eg. sea grass beds)	0.4
E	Sand / shingle shores (including dune systems)	0.3
F	Estuarine waters	13
G	Tidal flats	77.7
H	Salt marshes	8.4
6	Reservoirs / barrages / dams	0.2

9 **Ramsar Criteria** 4, 5, 6
 10 **Map of the site** ✓
 11 **Compiler** Joint Nature Conservation Committee
 Monkstone House
 City Road
 Peterborough
 Cambridgeshire PE1 1JY
 UK
 Telephone/Fax : +44(0) 1733 562626 / +44(0) 1733 555948

12 Justification of criteria

Ramsar criterion 4

The site is a staging area for migratory waterfowl including internationally important numbers of passage *Charadrius hiaticula*.

Ramsar criterion 5

Internationally important waterfowl assemblage (greater than 20,000 birds)

Ramsar criterion 6

Over winter the site regularly supports internationally important populations of: Bar-tailed Godwit *Limosa lapponica*, Curlew *Numenius arquata*, Dunlin *Calidris alpina alpina*, Grey Plover *Pluvialis squatarola*, Knot *Calidris canutus*, Oystercatcher *Haematopus ostralegus*, Pink-footed Goose *Anser brachyrhynchus*, Pintail *Anas acuta*, Redshank *Tringa totanus*, Shelduck *Tadorna tadorna*, Turnstone *Arenaria interpres*

13 General location

Nearest town/city: Morecambe

Morecambe Bay is located within the counties of Cumbria and Lancashire in northwest England

Administrative Region: Cumbria, Lancashire

14 Physical Features

Soil & Geology	boulder, clay, cobble, gravel, limestone, limestone/chalk, mud, neutral, pebble, sand, sedimentary, shingle
Geomorphology and Landscape	coastal, enclosed coast (including embayment), estuary, floodplain, intertidal rock, intertidal sediments (including sandflat/mudflat), islands, lagoon, lowland, open coast (including bay), pools, shingle bar, sound/strait, subtidal rock (including rocky reefs), subtidal sediments (including sandbank/mudbank)
Nutrient status	mesotrophic
pH	circumneutral
Salinity	saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Rainy, temperate climate with a mild winter and periodic frost. Mean minimum temperature approximately 7.4°C. Mean maximum temperature approximately 14.4°C. Mean annual precipitation approximately 6222.4mm, with a winter maximum.

15 Hydrological values

Shoreline stabilisation and dissipation of erosive forces

16 Ecological features

The main habitat types of the Morecambe Bay Ramsar site are: Intertidal mudflats and sandflats, saltmarsh, shingle, rocky scars, sand dunes.

A large shallow estuary, with extensive intertidal mudflats, saltmarshes, subtidal sediments and rocky shorelines.

There are small areas of eelgrass *Zostera* beds and vegetated shingle.

The saltmarshes are traditionally heavily grazed and provide important wildfowl habitat.

17 Noteworthy flora

None.

18 Noteworthy fauna

Birds

Species occurring at levels of international importance (as identified at designation):

On passage the area regularly supports:

Ringed Plover (*Charadrius hiaticula*)
(Europe/Northern Africa (wintering))

693 individuals, representing an average of 1.5% of the population (5 year peak mean for 1991/92 to 1995/96)

Over winter the area regularly supports:

Bar-tailed Godwit, *Limosa lapponica*
(Western Palearctic (wintering))

2611 individuals, representing an average of 2.6% of the population (5 year peak mean for 1991/92 to 1995/96)

Curlew, <i>Numenius arquata</i> (Europe (breeding))	13620 individuals, representing an average of 3.9% of the population (5 year peak mean for 1991/92 to 1995/96)
Dunlin, <i>Calidris alpina alpina</i> (Northern Siberia/Europe/Western Africa)	52671 individuals, representing an average of 3.8% of the population (5 year peak mean for 1991/92 to 1995/96)
Grey Plover, <i>Pluvialis squatarola</i> (Eastern Atlantic (wintering))	1813 individuals, representing an average of 1.1% of the population (5 year peak mean for 1991/92 to 1995/96)
Knot, <i>Calidris canutus</i> (Northeastern Canada/Greenland/Iceland/Northwestern Europe)	29426 individuals, representing an average of 8.5% of the population (5 year peak mean for 1991/92 to 1995/96)
Oystercatcher, <i>Haematopus ostralegus</i> (Europe & Northern/Western Africa)	47572 individuals, representing an average of 5.4% of the population (5 year peak mean for 1991/92 to 1995/96)
Pink-footed Goose, <i>Anser brachyrhynchus</i> (Eastern Greenland/Iceland/UK)	2475 individuals, representing an average of 1.1% of the population (5 year peak mean for 1991/92 to 1995/96)
Pintail, <i>Anas acuta</i> (Northwestern Europe)	2804 individuals, representing an average of 4.7% of the population (5 year peak mean for 1991/92 to 1995/96)
Redshank, <i>Tringa totanus</i> (Eastern Atlantic (wintering))	6336 individuals, representing an average of 3.6% of the population (5 year peak mean for 1991/92 to 1995/96)
Shelduck, <i>Tadorna tadorna</i> (Northwestern Europe)	6372 individuals, representing an average of 2.1% of the population (5 year peak mean for 1991/92 to 1995/96)
Turnstone, <i>Arenaria interpres</i> (Western Palearctic (wintering))	1583 individuals, representing an average of 2.4% of the population (5 year peak mean for 1991/92 to 1995/96)

Assemblages of international importance:

Over winter the area regularly supports:

210668 waterfowl (5 year peak mean for 1991/92 to 1995/96)

Species occurring at levels of national importance:

During the breeding season the area regularly supports:

Herring Gull, <i>Larus argentatus</i> (Northwestern Europe (breeding) and Iceland/Western Europe (breeding))	11000 pairs, representing an average of 6.9% of the GB population (5 year mean for 1992 to 1996)
Lesser Black-backed Gull, <i>Larus fuscus</i> (Western Europe/Mediterranean/Western Africa)	22000 pairs, representing an average of 26.5% of the GB population (5 year mean for 1992 to 1996)

Sandwich Tern, *Sterna sandvicensis*
(Western Europe/Western Africa)

290 pairs, representing an average of 2.1% of the
GB population (5 year mean for 1992 to 1996)

On passage the area regularly supports:

Sanderling, *Calidris alba*
(Eastern Atlantic/Western & Southern Africa
(wintering))

2466 individuals, representing an average of
10.6% of the GB population (5 year peak mean for
1991/92 to 1995/96)

Over winter the area regularly supports:

Cormorant, *Phalacrocorax carbo*
(Northwestern Europe)

879 individuals, representing an average of 6.7%
of the GB population (5 year peak mean for
1991/92 to 1995/96)

Eider, *Somateria mollissima*
(Britain/Ireland)

6400 individuals, representing an average of 8.3%
of the GB population (5 year peak mean for
1991/92 to 1995/96)

Goldeneye, *Bucephala clangula*
(Northwestern/Central Europe)

445 individuals, representing an average of 2.6%
of the GB population (5 year peak mean for
1991/92 to 1995/96)

Golden Plover, *Pluvialis apricaria*
(Northwestern Europe (breeding))

4097 individuals, representing an average of 1.6%
of the GB population (5 year peak mean for
1991/92 to 1995/96)

Great Crested Grebe, *Podiceps cristatus*
(Northwestern Europe (wintering))

318 individuals, representing an average of 3.2%
of the GB population (5 year peak mean for
1991/92 to 1995/96)

Lapwing, *Vanellus vanellus*
(Europe (breeding))

17669 individuals, representing an average of
1.2% of the GB population (5 year peak mean for
1991/92 to 1995/96)

Red-breasted Merganser, *Mergus serrator*
(Northwestern/Central Europe)

292 individuals, representing an average of 2.9%
of the GB population (5 year peak mean for
1991/92 to 1995/96)

Wigeon, *Anas penelope*
(Western Siberia/Northwestern/Northeastern
Europe)

5838 individuals, representing an average of
2.1% of the GB population (5 year peak mean for
1991/92 to 1995/96)

19 Social and Cultural Values

Aesthetic

Aquatic vegetation (e.g. reeds, willows, seaweed)

Archaeological/historical site

Conservation education

Current scientific research

Fisheries production

Livestock grazing

Non-consumptive recreation

Sport fishing

Sport hunting

Subsistence fishing

Tourism

Traditional cultural

Transportation/navigation

20 Land tenure/ownership

Ownership category	On-Site	Off-Site
Non-governmental organisation	+	+
National/Crown estate	+	+
Private	+	+

21 Current land use

Activity	On-Site	Off-Site	Scale
Nature conservation	+	+	Large-Scale
Tourism	+	+	Large-Scale
Recreation	+	+	Large-Scale
Research	+	+	Small-Scale
Collection of non-timber natural products: commercial	+		Small-Scale
Commercial forestry		+	Small-Scale
Fishing: commercial	+	+	Small-Scale
Fishing: recreational/sport	+		Small-Scale
Marine/saltwater aquaculture	+		Small-Scale
Gathering of shellfish	+		Small-Scale
Bait collection	+		Small-Scale
Grazing (unspecified)	+	+	Large-Scale
Permanent pastoral agriculture	+	+	Large-Scale
Hunting: recreational/sport	+	+	Small-Scale
Industrial water supply	+		Large-Scale
Industry	+	+	Large-Scale
Sewage treatment/disposal	+	+	Large-Scale
Harbour/port	+	+	Small-Scale
Mineral exploration		+	Small-Scale
Oil/gas production		+	Large-Scale
Transport route	+	+	Large-Scale
Urban development		+	Large-Scale
Non-urbanised settlements		+	Large-Scale

22 Adverse factors affecting the ecological character of the site

Activity	On-Site	Off-Site	Scale
Overgrazing by domestic livestock	+		Small-Scale
Drainage/reclamation for agriculture		+	Large-Scale
Dredging	+		Small-Scale
Over fishing	+		Small-Scale
Pollution - unspecified	+		Large-Scale

23 Conservation measures taken

Conservation measure	On-site	Off-site
SSSI	+	
NNR	+	+
SPA	+	
Candidate SAC	+	
Land owned by a NGO for nature conservation	+	+
Site management statement/plan implemented	+	+

24 Conservation measures proposed but not yet implemented

see below

Site vulnerability and management statement

The site is subjected to a wide range of pressures such as reclamation for agriculture, over-grazing, dredging, over-fishing, industrial uses and unspecified pollution. However, overall the site is relatively robust and many of those pressures have only slight to local effects and are being addressed through Management Plans. The breeding tern interest is very vulnerable and the colony has recently moved to the adjacent Duddon Estuary. Positive management is being secured through management plans for non-governmental organisation reserves, English Nature Site Management Statements, European Marine Site Management Scheme, and the Morecambe Bay Partnership.

25 Current scientific research/survey/monitoring and facilities

Fauna.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Habitat.

Baseline habitat review/survey being completed by English Nature for European Marine Site Management Scheme.

26 Current conservation education

None

27 Current recreation and tourism

Activities.

Angling, wildfowling, bait collection, walking sailing, windsurfing and birdwatching.

Facilities provided.

There are interpretative facilities at South Walney, Foulney and Leighton Moss reserves, and in the nearby town of Morecambe.

Seasonality.

Wildfowling occurs from 1 September to 20 February.

28 Functional jurisdiction

Department of the Environment, Transport and the Regions

28. *Jurisdiction* - territorial jurisdiction - England

29 Management authority

English Nature

English Nature

Northminster House

Telephone +44 1733 455000

30 Bibliography

Peterborough PE1 1UA

Fax +44 1733 568834

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- Reference should also be made to Country Agencies Management Plans for sites that are within National Nature Reserves.

European Site Conservation Objectives for Leighton Moss Special Protection Area Site Code: UK9005091



With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A021 *Botaurus stellaris*; Great bittern (Breeding)

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 21 February 2019 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

COUNTY: LANCASHIRE

SITE NAME: LEIGHTON MOSS

DISTRICT: LANCASTER

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

Local Planning Authority: Lancaster City Council

National Grid Reference: SD 483749

Area: 124.9 (ha.) 309 (ac.)

Ordnance Survey Sheet: 1:50,000 97

1:10,000 SD 47 NE/SE

Date Notified (Under 1949 Act): 1951

Date of Last Revision: 1979

Date Notified (Under 1981 Act): 1984

Date of Last Revision: 1984

Other information:

1. Originally notified in 1951 as Storr's Moss.
2. Boundary revised by partial deletion at renotification.
3. The site is listed in "A Nature Conservation Review" ed. D A Ratcliffe (1977) Cambridge University Press.
4. Most of the site is an RSPB reserve.
5. Site is situated in the Arnside-Silverdale AONB.
6. Otters and red squirrels, protected species listed on Schedule 5 of the above Act are resident.

Reasons for Notification

Leighton Moss, situated between Warton Crag and Silverdale on the edge of Morecambe Bay, is a site of outstanding ornithological importance. It contains the largest reedbed in North West England and the only large reedbed in Lancashire; the only other example of any significant size being the nearby Hawes Water Moss.

The site was originally an extensive peat moss which was drained and brought into agricultural use as arable land in the 19th Century. In 1917, following cessation of pumped drainage, the valley flooded with base-rich water from the surrounding limestone hills and soon developed into a Phragmites reedbed. In 1964 Leighton Moss became an RSPB reserve and has since been managed to maintain and diversify the habitats of wetland birds. There are extensive areas of open water in the reedbeds, and areas of willow scrub and mixed fen vegetation. A typical and varied fen flora has developed in some parts and this shows all stages of transition from open water to woodland.

The reedbeds are important as a northern outpost of broadland-type avifauna, with nationally important breeding populations of bittern (about 12 pairs, ie about 25% of the current British population) and bearded tit (about 30 pairs) but the diversity of habitat supports a wide range of birds with over 65 species breeding regularly. These include important populations of pochard (about 8 pairs) and shoveler (about 15 pairs), a large population of reed warbler (one of the most northerly colonies in Britain), sedge and grasshopper warblers, water rail, spotted crane and a wide range of waterfowl. The site also supports a variety of passage and wintering waterfowl and other birds, including nationally important numbers of teal (up to 1800), shoveler (up to 220) and gadwall (up to 35).

The site is also of value for other fauna. It is one of the few places in Lancashire where otters regularly breed. Red squirrels, roe and red deer occur, and a wide range of butterflies have been recorded from the site.

This citation / map relates to a site entered in
the Register of European sites for Great Britain.
Register reference number UK0000507
Date of registration 30 JAN 1996

Signed Bux
on behalf of the Secretary of State for the Environment

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

Joint Nature Conservation Committee

Monkstone House

City Road

Peterborough

Cambridgeshire PE1 1JY

UK

Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948

Email: RIS@JNCC.gov.uk

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DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

Designated: 28 November 1985

3. Country:

UK (England)

4. Name of the Ramsar site:

Leighton Moss

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

**** Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* ☐;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) *Yes*
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* ☐;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

54 10 03 N 02 47 31 W

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Lancaster

Leighton Moss lies between Warton and Silverdale on the eastern edge of Morecambe Bay.

Administrative region: Lancashire

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 128.61

Min. 5

Max. 5

Mean 5

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Leighton Moss is the largest reedbed in north-west England and is situated on the eastern edge of Morecambe Bay in Lancashire. Large areas of open water are surrounded by extensive reedbeds in which areas of willow scrub and mixed fen vegetation also occur. A typical and varied fen flora has developed in part, whilst the reedbed shows all stages of seral transition from open water through to woodland.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

An example of large reedbed habitat characteristic of the biogeographical region. The reedbeds are of particular importance as a northern outpost for breeding populations of great bittern *Botaurus stellaris*, Eurasian marsh harrier *Circus aeruginosus* and bearded tit *Panurus biarmicus*.

Ramsar criterion 3

The site supports a range of breeding birds including great bittern *Botaurus stellaris*, Eurasian marsh harrier *Circus aeruginosus* and bearded tit *Panurus biarmicus*.

Species occurring in nationally important numbers outside the breeding season include northern shoveler *Anas clypeata* and water rail *Rallus aquaticus*

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	basic, clay, peat, nutrient-rich, sedimentary, limestone
Geomorphology and landscape	lowland, coastal, floodplain
Nutrient status	mesotrophic
pH	alkaline
Salinity	fresh
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Blackpool, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/blackpool.html) Max. daily temperature: 12.9° C Min. daily temperature: 6.4° C Days of air frost: 40.3 Rainfall: 871.3 mm Hrs. of sunshine: 1540.3

General description of the Physical Features:

Leighton Moss is the largest reedbed in this region. It was originally a peatbog and was pump-drained and cultivated during the early 1900s and then allowed to revert to reedbed between the First and Second World Wars. As well as reedbeds, there are extensive areas of open water, large areas of tussock-sedge *Carex* spp. and transitional communities through fen to willow *Salix* spp. scrub and woodland. A typical and varied fen flora has developed in part, whilst the reedbed shows all stages of serial transition from open water through to woodland.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Base-rich water flows into the marsh from the surrounding limestone hills.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

19. Wetland types:

Inland wetland

Code	Name	% Area
U	Peatlands (including peat bogs swamps, fens)	73.7
O	Freshwater lakes: permanent	16.8
W	Shrub-dominated wetlands	9.5

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

No ecological features described on this site.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

None reported

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds**Species currently occurring at levels of national importance:****Species regularly supported during the breeding season:**

Eurasian marsh harrier, *Circus aeruginosus*, Europe 2 pairs, representing an average of 1.3% of the GB population (Source period not collated)

Species with peak counts in spring/autumn:

Northern shoveler, *Anas clypeata*, NW & C Europe 166 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Water rail, *Rallus aquaticus*, Europe 14 individuals, representing an average of 3.1% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information**Nationally important species occurring on the site.**

Mammals.*Lutra lutra***Invertebrates.***Sphserophoria loewi*, *Photodes captiuncula***23. Social and cultural values:**

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic

Aquatic vegetation (e.g. reeds, willows, seaweed)

Environmental education/ interpretation

Non-consumptive recreation

Scientific research

Tourism

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Private	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	
Commercial forestry		+
Cutting of vegetation (small-scale/subsistence)		+
Grazing (unspecified)		+
Rough or shifting grazing		+

Permanent pastoral agriculture		+
Transport route		+
Non-urbanised settlements		+

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.
2. Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Sedimentation/siltation	1	Natural processes causing sedimentation. This results in increased turbidity and loss of aquatic flora and subsequently decreased quality of bittern habitat.	+	+	+
Pollution – pesticides/agricultural runoff	2	Slurry from adjacent dairy farm and inorganic compounds from other agricultural sources.		+	+

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
 Pollution – pesticides/agricultural runoff - The cut off drains on adjacent farmland will be renovated. Additional measures to reduce diffuse agricultural pollution include those to be implemented under the Water Framework Directive and new incentives under changes to the Common Agricultural Policy through the Single Farm Payment Scheme and Environmental Stewardship Scheme, including adherence to “Codes of Good Agricultural Practice.”

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	+
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	

Site management statement/plan implemented	+	
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b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.

Numbers of migratory birds and wildfowl and waders are monitored annually as part of the national Irish Wetland Birds Survey (I-WEBS) organised by the IWC Birdwatch Ireland, the National Parks and Wildlife Service (Ireland) and the Wildfowl and Wetlands Trust.

Considerable amounts of research continues to be undertaken by the RSPB on bittern and bearded tit feeding/breeding ecology, in addition to reedbed management.

Invertebrate data is collected by volunteers and specialist on a regular basis.

Environment.

Daily weather records, water level and water quality monitoring is undertaken by RSPB wardening staff.

Visitor usage and visitor numbers are monitored on a daily basis at this extremely popular and well visited RSPB bird reserve.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

The Royal Society for the Protection of Birds employs a number of warden-teachers who undertake environmental educational work and escort large numbers of school parties around Leighton Moss throughout most of the year. Various educational programmes are also run for adults and a series of public guided walks have become popular in more recent years. The RSPB has excellent visitor and school room facilities as part of its interpretative centre on the reserve.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.

The RSPB employs a number of warden-teachers who undertake environmental educational work and escort large numbers of school parties around Leighton Moss throughout most of the year. Various educational programmes are also run for adults and a series of public guided walks have become popular in more recent years.

The RSPB has excellent visitor and school room facilities as part of its interpretative centre on the reserve.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs,
European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol,
BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House,
Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

Site-relevant references

- Cranswick, PA, Waters, RJ, Musgrove, AJ & Pollitt, MS (1997) *The Wetland Bird Survey 1995–96: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge
- Gray, LC (1980) *Environmental bibliography of north-west England (vice-counties 59, 60, 69 and 70) 1850–1979*. University of Lancaster Library, Lancaster (Library Occasional Paper, No. 10)
- Musgrove, AJ, Pollitt, MS, Hall, C, Hearn, RD, Holloway, SJ, Marshall, PE, Robinson, JA & Cranswick, PA (2001) *The Wetland Bird Survey 1999–2000: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge.
www.wwt.org.uk/publications/default.asp?PubID=14
- Ratcliffe, DA (ed.) (1977) *A Nature Conservation Review. The selection of biological sites of national importance to nature conservation in Britain*. Cambridge University Press (for the Natural Environment Research Council and the Nature Conservancy Council), Cambridge (2 vols.)
- Stroud, DA, Chambers, D, Cook, S, Buxton, N, Fraser, B, Clement, P, Lewis, P, McLean, I, Baker, H & Whitehead, S (eds.) (2001) *The UK SPA network: its scope and content*. Joint Nature Conservation Committee, Peterborough (3 vols.)
www.jncc.gov.uk/UKSPA/default.htm
- Wilson, J (n.d. [~1989]) *Leighton Moss and Morecambe Bay Reserve. The first twenty-five years 1964–1988*. Royal Society for the Protection of Birds
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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • email: ramsar@ramsar.org

European Site Conservation Objectives for Calf Hill and Cragg Woods Special Area of Conservation

Site code: UK0030106



With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats
- The structure and function (including typical species) of qualifying natural habitats, and
- The supporting processes on which qualifying natural habitats rely

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H91A0. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles; Western acidic oak woodland
H91E0. Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*); Alder woodland on floodplains*

* denotes a priority natural habitat or species (supporting explanatory text on following page)

* Priority natural habitats or species

Some of the natural habitats and species for which UK SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Habitats Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the "Habitats Regulations"). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Calf Hill and Cragg Woods
Unitary Authority/County: Lancashire
SAC status: Designated on 1 April 2005
Grid reference: SD543614
SAC EU code: UK0030106
Area (ha): 34.43
Component SSSI: Calf Hill and Cragg Woods SSSI

Site description:

These old sessile oak *Quercus petraea* woods occupy north- and south-facing slopes of a valley on millstone grit. Oak dominates in the canopy with birch *Betula* sp., rowan *Sorbus aucuparia* and holly *Ilex aquifolium*. The ground flora ranges from areas of abundant bilberry *Vaccinium myrtillus*, through grassy areas, to rich moss carpets. Small areas of alder *Alnus glutinosa* flushes also occur.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*). (Alder woodland on floodplains)*
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. (Western acidic oak woodland)

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0030106
Date of registration: 14 June 2005

Signed: *Trevor Salmon*

On behalf of the Secretary of State for Environment,
Food and Rural Affairs

European Site Conservation Objectives for Ingleborough Complex Special Area of Conservation Site Code: UK0012782



With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats**
- **The structure and function (including typical species) of qualifying natural habitats, and**
- **The supporting processes on which qualifying natural habitats rely**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H5130. *Juniperus communis* formations on heaths or calcareous grasslands; Juniper on heaths or calcareous grasslands

H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone

H6410. *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); Purple moor-grass meadows

H7130. Blanket bogs*

H7220. Petrifying springs with tufa formation (*Cratoneurion*); Hard-water springs depositing lime*

H7230. Alkaline fens; Calcium-rich springwater-fed fens

H8210. Calcareous rocky slopes with chasmophytic vegetation; Plants in crevices in base-rich rocks

H8240. Limestone pavements*

H9180. *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes*

* denotes a priority natural habitat or species (supporting explanatory text on following page)

* Priority natural habitats or species

Some of the natural habitats and species for which UK SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Habitats Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the "Habitats Regulations"). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Ingleborough Complex
Unitary Authority/County: North Yorkshire
SAC status: Designated on 1 April 2005
Grid reference: SD756739
SAC EU code: UK0012782
Area (ha): 5769.28
Component SSSI: Ingleborough SSSI, Oxenber and Wharfe Woods SSSI, Whernside SSSI

Site description:

Ingleborough is Britain's finest karst area, the characteristic limestone landforms having been produced largely under glacial conditions. It is particularly noted for extensive dry stone pavements, dry valleys and gorges, shakeholes and sinkholes. Associated with the various acidic and basic strata, together with drift and peat which obscure the rocks over large areas, there is a wide range of vegetation types. Where limestone occurs at the surface, there is calcareous grassland dominated by blue-moor grass *Sesleria albicans*, while elsewhere blanket-bog is dominated by hare's-tail cottongrass *Eriophorum vaginatum*. Where flushing occurs the blanket-bog becomes floristically richer with sundew *Drosera rotundifolia*, cranberry *Vaccinium oxycoccos* and bog asphodel *Narthecium ossifragum*.

It has the most extensive series of limestone pavements in the UK, varying from moderate altitude to montane in character (300-640 m). The pavements range from those where grazing is completely excluded (Colt Park Wood), to some where grazing is restricted (pavements amidst cattle-grazed pastures) and others within common land intensively grazed by sheep. Characteristic species include baneberry *Actaea spicata*, great bellflower *Campanula latifolia*, lily-of-the-valley *Convallaria majalis*, marsh hawk's-beard *Crepis paludosa*, wall lettuce *Mycelis muralis*, lesser meadow-rue *Thalictrum minus* and mountain melick *Melica nutans*. Among the ferns, green spleenwort *Asplenium viride*, brittle bladder-fern *Cystopteris fragilis* and hard shield-fern *Polystichum aculeatum* occur on most pavements. Rigid buckler-fern *Dryopteris submontana* and limestone fern *Gymnocarpium robertianum* are widespread. Dog's mercury *Mercurialis perennis* and wood sorrel *Oxalis acetosella* occur on most pavements. Amid stands of calcareous grassland it has the only large stands of juniper on limestone pavements at high altitude in the UK. The scrub is of the relatively species-poor type typical of these situations.

Spring-fed flush fens are extensive across Ingleborough, commonly associated with calcareous grassland types, but also found amidst acid grasslands and heathland communities. They are often species-rich communities, in which rare or locally distributed species such as bird's-eye primrose *Primula farinosa*, black bog-rush *Schoenus nigricans*, few-flowered spike-rush *Eleocharis quinqueflora* and flat-sedge *Blasmus compressus* are frequent.

Crevice communities occur on extensive limestone scars and are characteristic of the area. The flora has a mix of northern and southern species, including purple saxifrage *Saxifraga oppositifolia*, yellow saxifrage *S. aizoides*, alpine meadow-grass *Poa alpina*, hoary whitlowgrass *Draba incana*, lesser meadow-rue *Thalictrum minus*, wall lettuce *Mycelis muralis* and baneberry.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Blanket bogs*
- Limestone pavements*
- Petrifying springs with tufa formation (*Cratoneurion*). (Hard-water springs depositing lime)*
- *Tilio-Acerion* forests of slopes, screes and ravines. (Mixed woodland on base-rich soils associated with rocky slopes)*
- Alkaline fens. (Calcium-rich springwater-fed fens)
- Calcareous rocky slopes with chasmophytic vegetation. (Plants in crevices in base-rich rocks)
- *Juniperus communis* formations on heaths or calcareous grasslands. (Juniper on heaths or calcareous grasslands)
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*). (Purple moor-grass meadows)
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*). (Dry grasslands and scrublands on chalk or limestone)

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.

Register reference number: UK0012782

Date of registration: 14 June 2005

Signed: *Trevor Salmon*

On behalf of the Secretary of State for Environment,
Food and Rural Affairs

European Site Conservation Objectives for North Pennine Dales Meadows Special Area of Conservation Site Code: UK0014775



With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats**
- **The structure and function (including typical species) of qualifying natural habitats, and**
- **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H6410. *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); Purple moor-grass meadows

H6520. Mountain hay meadows

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the “Habitats Regulations”). They must be considered when a competent authority is required to make a ‘Habitats Regulations Assessment’, including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term ‘favourable conservation status’ is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: North Pennine Dales Meadows
Unitary Authority/County: Cumbria, Durham, Lancashire, North Yorkshire, Northumberland
SAC status: Designated on 1 April 2005
Grid reference: NY931256
SAC EU code: UK0014775
Area (ha): 497.09
Component SSSI: See list below

Site description:

This site contains a series of isolated fields within several north Pennine and Cumbrian valleys, and encompasses the range of variation exhibited by mountain hay meadows in the UK. The grasslands included within the site exhibit very limited effects of agricultural improvement and show good conservation of structure and function. A wide range of rare and local meadow species are contained within the meadows, including globeflower *Trollius europaeus*, the lady's-mantles *Alchemilla acutiloba*, *A. monticola* and *A. subcrenata*, and spignel *Meum athamanticum*.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*). (purple moor-grass meadows)
- Mountain hay meadows

List of component SSSIs:

Arkle Beck Meadows, Whaw SSSI
Ashes Pasture and Meadows SSSI
Askrigg Bottoms SSSI
Aules Hill Meadows SSSI
Barrowburn Meadows SSSI
Bell Sykes Meadows SSSI
Borrow Beck Meadows SSSI
Bowber Head and Piper Hole Meadows SSSI
Bowlees and Friar House Meadows SSSI
Bretherdale Meadows SSSI
Catton Lea Meadow SSSI
Cautley Thwaite Meadows and Ecker Secker Beck SSSI
Cliff Beck Meadow, Buttertubs SSSI
Cornriggs Meadows SSSI
Deepdale Meadows SSSI (*Cumbria*)
Deepdale Meadows SSSI (*North Yorkshire, known as "Deepdale Meadows, Langstrothdale"*)
Durtrees Burn Grassland SSSI
Far High House Meadows SSSI
Fothering Holme SSSI

Gingerfields SSSI
Gowk Bank SSSI
Grains O' th' Beck Meadows SSSI
Grassington Hospital Grounds SSSI
Greenhaugh Meadow SSSI
Hannah's Meadows SSSI
Harker's House Meadows, Keld SSSI
Heatheryburn Bank SSSI
High Knock Shield Meadow SSSI
Knarsdale Meadows SSSI
Langcliff Cross Meadow SSSI
Low Redford Meadows SSSI
Mere Beck Meadows SSSI
Middle Crossthwaite SSSI
Middle Side and Stonygill Meadows SSSI
Mill Holme Meadows, Thwaite SSSI
Muker Meadows SSSI
Myttons Meadows SSSI
New Close, Calvert Houses SSSI
New House Meadows, Malham SSSI
Oughtershaw and Beckermonds SSSI
Peckriding Meadows SSSI
Pry and Bottom Meadows, Mid-Mossdale SSSI
Raisbeck Meadows SSSI
Richmond Meadows SSSI
Rigg Farm and Stake Hill Meadows SSSI
Sandybeck Meadow SSSI
Scar Closes, Kisdonside SSSI
Stephen Ings, Crackpot SSSI
Swindale Meadows SSSI
Thorneyburn Meadow SSSI
Town End Meadows, Little Asby SSSI
Walden Meadows SSSI
West Newlandside Meadows SSSI
West Park Meadows SSSI
Wet Sleddale Meadows SSSI
White Ridge Meadow SSSI
Wilson Place Meadows
Yockenthwaite Meadows SSSI

This citation relates to a site entered in the Register of European Sites for Great Britain.

Register reference number: UK0014775

Date of registration: 14 June 2005

Signed: *Trevor Salmon*

On behalf of the Secretary of State for Environment,
Food and Rural Affairs

European Site Conservation Objectives for Morecambe Bay Pavements Special Area of Conservation Site Code: UK0014777



With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H3140. Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.; Calcium-rich nutrient-poor lakes, lochs and pools

H4030. European dry heaths

H5130. *Juniperus communis* formations on heaths or calcareous grasslands

H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone

H7210. Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; Calcium-rich fen dominated by great fen sedge (saw sedge)*

H8240. Limestone pavements*

H9180. *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes*

H91A0. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles; Western acidic oak woodland

H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland*

S1014. *Vertigo angustior*, Narrow-mouthed whorl snail

* denotes a priority natural habitat or species (supporting explanatory text on following page)

* Priority natural habitats or species

Some of the natural habitats and species for which UK SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Habitats Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the "Habitats Regulations"). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Morecambe Bay Pavements
Unitary Authority/County:	Cumbria, Lancashire
SAC status:	Designated on 1 April 2005
Grid reference:	SD440869
SAC EU code:	UK0014777
Area (ha):	2609.69
Component SSSI:	Cranglebarrow and Deepdale SSSI, Farleton Knott SSSI, Gait Barrows SSSI, Hawes Water SSSI, Hutton Roof Crag SSSI, Marble Quarry and Hale Fell SSSI, Middlebarrow SSSI, Scout and Cunswick Scars SSSI, Thrang End and Yealand Hall Allotment SSSI, Thrang Wood SSSI, Underlaid Wood SSSI, Whitbarrow SSSI

Site description:

This site is the best British example of lowland limestone pavements that range from low to moderate altitudes. Some of the pavements form woodland clearings that are sheltered and warm up quickly in spring. The pavement flora is here at its most diverse and, where stock grazing is absent, can be seen at its best because plant growth is not confined to the grikes (spaces between the limestone blocks that form the pavement). Trees and shrubs, including yew *Taxus baccata*, juniper *Juniperus communis*, buckthorn *Rhamnus catharticus*, hazel *Corylus avellana*, small-leaved lime *Tilia cordata* and ash *Fraxinus excelsior*, grow above the pavement surface. Ferns are well represented on the pavements and include rustyback *Ceterach officinarum* and the nationally scarce rigid buckler-fern *Dryopteris submontana* and limestone fern *Gymnocarpium robertianum*. These pavements also support strong populations of a number of distinctive species, characteristic of the habitat in its lowland setting. These include dark-red helleborine *Epipactis atrorubens*, angular Solomon's-seal *Polygonatum odoratum*, dropwort *Filipendula vulgaris*, rustyback and fingered sedge *Carex digitata*.

Calcareous grasslands dominated by blue moor-grass *Sesleria caerulea* have an overall northern character but are also rich in southern lowland species. There is a wide range of structural variation associated with intensity of grazing and the presence of cliffs, screes, and limestone pavements on the margins of the grassland stands. There are important transitions to calcareous scrub (including juniper scrub) and ash-lime woodlands. Heather *Calluna vulgaris* is a frequent component of the grassland sward and where the soils are deeper a heathland community occurs in an intricate mosaic with the grassland.

Although close to the northern limit of lime distribution, the ash-dominated woodland around Morecambe Bay contains many patches of small-leaved lime, which survive sometimes with elm *Ulmus* spp., often along outcrop edges. There is a rich assemblage of rare species, including fingered sedge, wood fescue *Festuca altissima* and mezereon *Daphne mezereum*. The habitat type occurs here both on limestone pavements and on loose scree and steep slopes. Yew occurs both as dense groves and as scattered trees in the understorey of ash or ash-elm woodland. Yew woodland here represents the development of long-established stands on scree and rocky slopes. Where the soils are deeper, and more acidic, small stands of oak woodland occur often with a heather dominated understorey.

Hawes Water is a lowland lake on a predominantly Carboniferous limestone foundation, with a substrate of deep lacustrine shell-marl (remains of shells of lake-dwelling animals). The water is highly calcareous and the lake is fed by springs within it. This site is considered to be the best example of a lowland lake with stoneworts *Chara* spp. in England, owing to the clarity, low nutrient status and high calcium content of its water. The rare rugged stonewort *Chara rudis* and scarce species *C. aspera*, *C. hispida* and *C. pedunculata* occur here. The lake is fringed by a belt of mixed fen. This includes areas of calcareous fen dominated by great fen sedge *Cladium mariscus*, often occurring in single species stands.

Gait Barrows supports strong populations of the narrow-mouthed whorl snail *Vertigo angustior* on the mossy clint (the limestone blocks which make up pavements) tops of limestone pavements at transitions to woodland, an unusual habitat for the species.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*. (Calcium-rich fen dominated by great fen sedge (saw sedge))*
- European dry heaths
- Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. (Calcium-rich nutrient-poor lakes, lochs and pools)
- *Juniperus communis* formations on heaths or calcareous grasslands. (Juniper on heaths or calcareous grasslands)
- Limestone pavements*
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. (Western acidic oak woodland)
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*). (Dry grasslands and scrublands on chalk or limestone)
- *Taxus baccata* woods of the British Isles. (Yew-dominated woodland)*
- *Tilio-Acerion* forests of slopes, screes and ravines. (Mixed woodland on base-rich soils associated with rocky slopes)*

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Narrow-mouthed whorl snail *Vertigo angustior*

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.

Register reference number: UK0014777

Date of registration: 14 June 2005

Signed: *Trevor Salmon*

On behalf of the Secretary of State for Environment, Food and Rural Affairs

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Witherslack Mosses
Unitary Authority/County: Cumbria
SAC status: Designated on 1 April 2005
Grid reference: SD457826
SAC EU code: UK0030302
Area (ha): 486.53
Component SSSI: Foulshaw Moss SSSI, Meathop Moss SSSI, Nichols Moss SSSI

Site description:

Witherslack Mosses comprises three individual sites – Meathop Moss, Nichols Moss and Foulshaw Moss – that are remnants of a formerly interconnected peat body on the west side of the Kent estuary, on its coastal plain. All retain some of the original dome structure, though each has been at least in part degraded by peat-cutting around the edges and by commercial forestry on Foulshaw Moss. Although restricted in area on Foulshaw Moss, each site contains good examples of cross-leaved heath *Erica tetralix* – *Sphagnum papillosum* (a bog-moss) raised and blanket mire, of the *Sphagnum magellanicum* – bog-rosemary *Andromeda polifolia* sub-community. Degraded raised bog predominates on Foulshaw Moss and is present around the edges of the other two.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Active raised bogs*
- Degraded raised bogs still capable of natural regeneration

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.

Register reference number: UK0030302

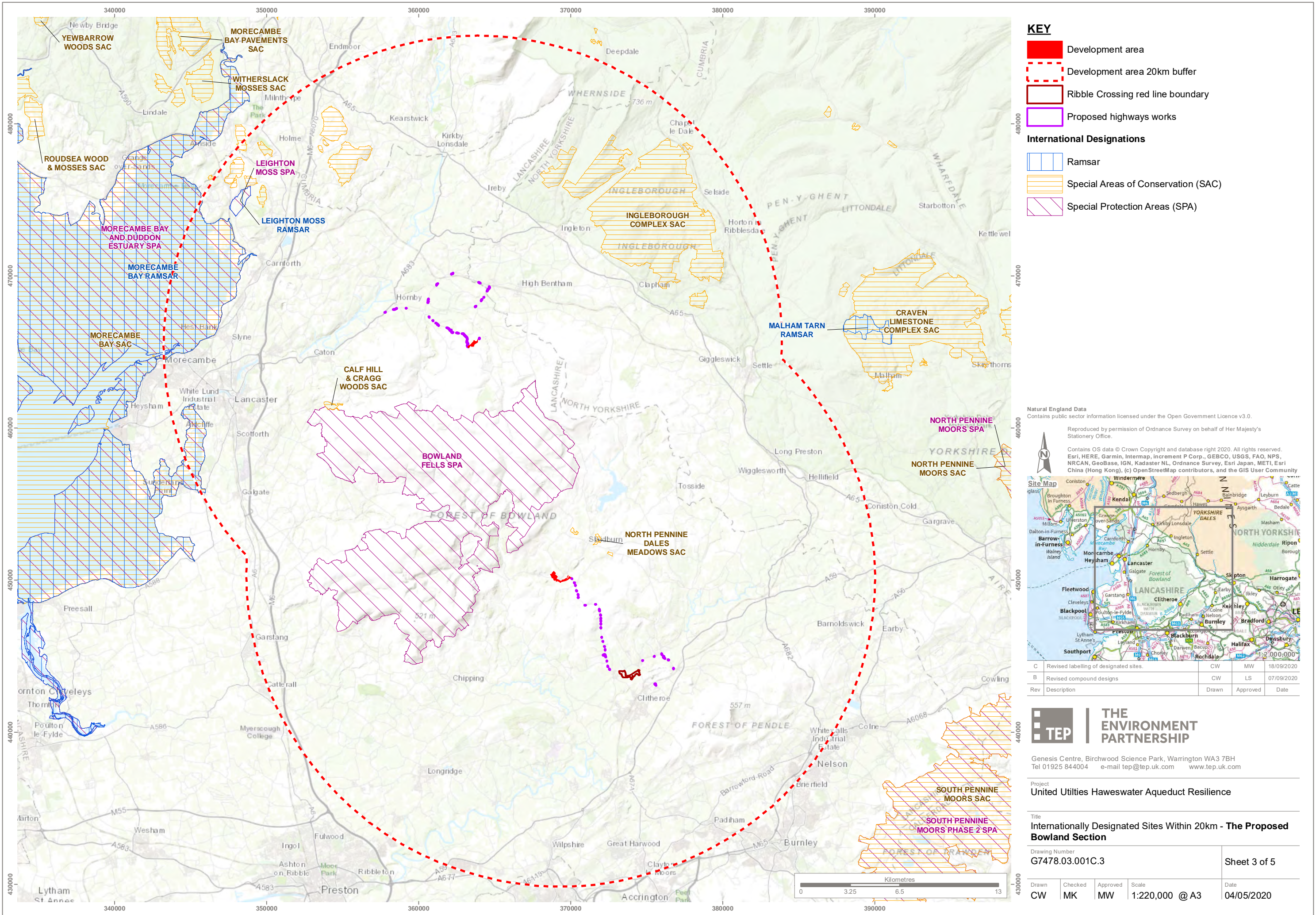
Date of registration: 14 June 2005

Signed: *Trevor Salmon*

On behalf of the Secretary of State for Environment, Food and Rural Affairs

DRAWINGS

G7478.03.001.3 Project Location and International Designated Sites





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