MORECAMBE BAY AND DUDDON ESTUARY SPA
& MORECAMBE BAY SAC

(SHADOW) HABITATS REGULATIONS ASSESSMENT: ASSESSMENT OF LIKELY SIGNIFICANT EFFECT

(REGULATION 63) THE CONSERVATION OF HABITATS AND SPECIES REGULATIONS 2017 (AS AMENDED)

For:

CUMBERLAND COUNCIL

Site:

THE IRON LINE,
HODBARROW NATURE RESERVE AND ADJACENT LAND,
MAINSGATE RD, MILLOM

Ref:

J217/RP01

***Date*:**

May 2023

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The Iron Line, Hodbarrow Nature Reserve and adjacent land, Mainsgate Rd, Millom

Client Name:	**Cumberland Council**
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CONTENTS

INTRODUCTION **3**
POTENTIAL IMPACTS ON THE INTEREST FEATURES **8**
CONCLUSION **42**
NATURE CONSERVATION ASSESSMENT: DUDDON ESTUARY SSSI **44**

APPENDIX 1 - MORECAMBE BAY SAC CONSERVATION OBJECTIVES
MORECAMBE BAY AND DUDDON ESTUARY SPA CONSERVATION OBJECTIVES
DUDDON ESTUARY SSSI CITATION

Author	**Date**
Lucy Gibson (nee Monhemius) MSc MCIEEM	19th May 2023

INTRODUCTION

1. This is the first part of the shadow Habitats Regulations Assessment, the screening assessment, called a (shadow) Assessment of Likely Significant Effect (sALSE) on European Sites. The assessment has been undertaken for the proposed Iron Line on Hodbarrow Nature Reserve and adjacent land, Mainsgate Rd, Millom, to comply with The Conservation of Habitats and Species Regulations 2017 (as amended) (previously The Conservation (Natural Habitats &c) Regulations 1994), in particular Regulations 63 and 64. Reference has been made to the guidance provided on gov.uk, 'Habitats regulations assessments: protecting a European Site' (https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site#screening).

2. In accordance with case law, this sHRA has considered an effect to be 'likely' if it 'cannot be excluded on the basis of objective information' and is 'significant' if it 'undermines the conservation objectives'. In accordance with Defra guidance on the approach to be taken to this decision, in plain English, the test asks whether the plan or project 'may' have a significant effect (i.e. there is a risk or a possibility of such an effect).

3. This assessment of risk therefore takes into account the precautionary principle (where there is scientific doubt) and excludes, at this stage, any measures proposed in the submitted details of the plan/project that are specifically intended to avoid or reduce harmful effects on the European site(s), as per the 'People Over Wind' judgment (People Over Wind & Peter Sweetman v Coillte Teoranta, April 2018). The judgment clarified that when making screening decisions for the purposes of deciding whether an appropriate assessment is required, competent authorities cannot take into account any mitigation measures which have been specifically added to achieve the purpose of avoiding or reducing harmful effects on a habitats site.

4. A Nature Conservation Assessment of likely impact of the proposed project on the notified interest features of the Duddon Estuary Site of Special Scientific Interest (SSSI) is also included in this document (page 44), due to the overlap of the SSSI notified interest features with interest features of the European designated sites, to enable compliance with the requirements of the Wildlife and Countryside Act 1981, as incorporated by the Countryside and Rights of Way Act 2000.

Type of Application:

5. Full Planning Permission; the case has not been decided yet.

Planning Application Reference Number:

6. TBC

Applicant:

7. Cumberland Council

European Sites' Names and Status:

8. Morecambe Bay and Duddon Estuary Special Protection Area (SPA) (was Duddon Estuary SPA) and Morecambe Bay Special Area of Conservation (SAC). As a whole, this report also covers the Duddon Estuary Ramsar Site.

Qualifying Features of European Importance (SPA):

9. *Qualifying Features:*

    - *Anas acuta*; Northern pintail (Non-breeding)
    - *Calidris canutus*; Red knot (Non-breeding)

- *Tringa totanus*; Common redshank (Non-breeding)
- *Sterna sandvicensis*; Sandwich tern (Breeding)
- Waterbird assemblage (area regularly supports over 210,000 individual waterfowl in the winter)*
- *Egretta garzetta*; Little egret (Non-breeding)
- *Cygnus cygnus*; Whooper swan (Non-breeding)
- *Anser brachyrhynchus*; Pink-footed goose (Non-breeding)
- *Tadorna tadorna*; Common shelduck (Non-breeding)
- *Haematopus ostralegus*; Eurasian oystercatcher (Non-breeding)
- *Charadrius hiaticula*; Ringed plover (Non-breeding)
- *Pluvialis apricaria*; European golden plover (Non-breeding)
- *Pluvialis squatarola*; Grey plover (Non-breeding)
- *Calidris alba*; Sanderling (Non-breeding)
- *Calidris alpina alpina*; Dunlin (Non-breeding)
- *Philomachus pugnax*; Ruff (Non-breeding)
- *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
- *Limosa lapponica*; Bar-tailed godwit (Non-breeding)
- *Numenius arquata*; Eurasian curlew (Non-breeding)
- *Arenaria interpres*; Ruddy turnstone (Non-breeding)
- *Larus melanocephalus*; Mediterranean gull (Non-breeding)
- *Larus fuscus*; Lesser black-backed gull (Non-breeding)
- *Larus fuscus*; Lesser black-backed gull (Breeding)
- *Larus argentatus*; Herring gull (Breeding)
- *Sterna hirundo*; Common tern (Breeding)
- *Sterna albifrons*; Little tern (Breeding)
- Sea bird assemblage (internationally important sea bird assemblage of over 62,000 individuals during the breeding season)

*All qualifying species are included in the SPA waterbird assemblage as main components. There are a further 19 species listed as main components: Black-headed Gull, Brent Goose (Light-bellied Nearctic), Common Gull, Cormorant, Eider (non-breeding), Goldeneye, Great White Egret, Greenshank, Green-winged Teal, Lapwing, Little Stint, Mallard, Red-breasted Merganser, Ring- necked Duck, Spotted Redshank, Teal, Wigeon. There are an additional 63 species that make up the rest of the waterbird assemblage: Arctic Tern, Avocet, Barnacle Goose, Bean Goose, Bean Goose (Tundra), Bewick's Swan, Bittern, Black Tern, Black-necked Grebe, Black-throated Diver, Bonaparte's Gull, Brent Goose, Brent Goose (Black Brant), Brent Goose (Dark-bellied), Common Sandpiper, Common Scoter, Coot, Curlew Sandpiper, Gadwall, Garganey, Glaucous Gull, Glossy Ibis, Goosander, Great Black-backed Gull, Great Crested Grebe, Great Northern Diver, Green Sandpiper, Grey Heron, Greylag Goose, Grey Phalarope, Iceland Gull, Jack Snipe, Kingfisher, Kittiwake, Lesser Yellowlegs, Little Grebe, Little Gull, Little Ringed Plover, Long-billed Dowitcher, Long-tailed Duck, Moorhen, Night-heron, Pectoral Sandpiper, Pochard, Purple Sandpiper, Red-necked Grebe, Red- throated Diver, Roseate Tern, Sabine's Gull, Scaup, Shag, Shoveler, Slavonian Grebe, Smew, Snipe, Spoonbill, Tufted Duck, Velvet Scoter, Water Rail, Whimbrel, White-fronted Goose (European), White- fronted Goose (Greenland), Wood Sandpiper, Woodcock and Yellow-legged Gull.

Qualifying Features of European Importance (Ramsar):

10. *Epidalea calamita;* Natterjack toad – the Duddon Estuary is one of the most important areas in Britain for this species, supporting 18-25% of the UK population of natterjack toads, equivalent to 50% of the Cumbrian population.

Qualifying Features of European Importance (SAC):

11. 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")

    (Annex I priority habitats on the proposed development site are denoted by an asterisk (*).)

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*.

13. According to the SAC citation, great crested newts are associated with the sand dune complex at Sandscale Haws, which lies across the bay to the south of Millom. Therefore, great crested newts are not a SAC interest feature of relevance to this sALSE, and are thus not considered further in this document.

Brief Description of Proposal(s):

14. This is an Assessment of Likely Significant Effect (ALSE) of a full planning application proposed for Hodbarrow RSPB Reserve and adjacent land, on Mainsgate Road, Millom. The project is called the Iron Line and comprises improvement works to walking and cycling routes around the reserve, installation of visitor facilities, including a welcome building and parking (on adjacent land), bird hides, benches, interpretation regarding the ecological and heritage interests of the site, and artwork. The proposed works have been designed carefully to include ecological

enhancements to improve the already important habitats on site, in addition to including measures to protect the existing high ecological value of the site and area.

15. The main Iron Line site is situated within Hodbarrow RSPB Reserve, which is located to the south-east of Mainsgate Road, approximately 530m south of Millom, a small town on the Cumbrian coast. The site of the proposed Iron Line welcome building and car park lies adjacent to the north-east of Hodbarrow Reserve, outside of the reserve (and designated site) boundaries. Millom Recycling Centre lies adjacent to the north of the proposed welcome building and car park site within Redhills Quarry. Adjacent to the north of Hodbarrow Reserve lies a site comprising mainly very large slag heaps and a waterbody. Adjacent to the east of Hodbarrow Reserve lies pasture and to the south lies the estuary. The western part of Hodbarrow Reserve comprises the flooded mine working known as Hodbarrow Lagoon, the largest coastal lagoon in the north-west. The lagoon is enclosed by a sea wall that extends from the south-west of the reserve to Haverigg to the west. There is an island in the lagoon near the sea wall, which supports internationally important breeding populations of little terns, common terns and sandwich terns during summer months. A bund has been created by the RSPB along the northern edge of the sea wall to prevent people and dogs on the sea wall visually disturbing the breeding terns, and there is a small hide on the sea wall to view the terns and other birds using the island.

16. Hodbarrow Reserve is a brownfield site, situated on the former Hodbarrow Iron Mine, which was closed in 1968. It is approximately 105ha in size, broadly comprising two large waterbodies, the lagoon, large areas of dense scrub, grassland, the sea wall, sand dunes, sandy and rocky beaches and bare rock. There is a substantial amount of rubble and slag across the site, from the iron mine and associated buildings that were dismantled. There are four substantial structures remaining on the reserve: a concrete bird hide situated near the lagoon island on the sea wall, a steel lighthouse on the sea wall opposite the bird hide, the original stone lighthouse in the south-west of the reserve and the remains of a stone windmill in the south of the reserve. A byway open to all traffic (BOAT) runs from Mainsgate Road across the reserve to the south-east, before turning to the south-west and extending along the sea wall to Haverigg caravan park. The BOAT is in a poor condition along much of its length, with many potholes and deep ruts across its surface. Despite this, motor vehicles including cars and motorbikes still drive along the BOAT across the reserve and sometimes over adjacent habitats. In addition to the BOAT, there are many paths and desire lines across the reserve, created by walkers and cyclists, most of which are unsurfaced.

17. The whole of Hodbarrow Reserve lies within the following designated sites: Morecambe Bay and Duddon Estuary Special Protected Area (SPA), Duddon Estuary Special Area of Conservation (SAC) and Ramsar, and the Duddon Estuary Site of Special Scientific Interest (SSSI). The proposed welcome building and car park site lies directly adjacent to the north-east of these designated sites. Approximately 900m to the north-east of the proposed development site lies Millom Ironworks Local Nature Reserve (LNR), which supports a known breeding population of natterjack toad. The Millom Ironworks LNR is also covered partially by the Morecambe Bay and Duddon Estuary SPA, Ramsar, and Duddon Estuary SSSI designations.

18. The following documents have been prepared as part of the planning application and were examined (where relevant), along with other relevant information and correspondence, as part of the sALSE (abbreviations used for the documents in this assessment are shown in brackets):

    - Preliminary Ecological Appraisal (Summary), Hodbarrow Reserve, December 2021 – Appletons (PEA1)
    - Preliminary Ecological Appraisal (Summary), alternative car park site (Redhills), January 2022 – Appletons (PEA2)

- Presence/Absence Surveys for Natterjack Toads and Great Crested Newt - Phase 1, August 2021 – Tyrer Ecological Consultants Ltd (P/A NJT GCN)
- Natterjack Toad Surveys – 2022 – Tyrer Ecological Consultants Ltd (NJTS)
- Botanical Survey Report, July 2022 – Joshua Styles (BSR)
- Visitor and Access Management Plan, March 2023 – Appletons (VAMP)
- Contractors' Potential Lay-Down Areas, March 2023 – Layer (CPLDA)
- General Arrangement/Site Masterplan (Rev 3), March 2023 – Layer (SM)
- Habitat Calculations Plan, March 2023 – Layer (HCP)
- Ecological Impact Assessment, May 2023 – Greengage (EcIA)
- Design and Access Statement (and accompanying drawings), May 2023 – Layer (DAS)
- Preliminary Risk Assessment, March 2023 – Curtins (PRA)
- Construction Method Statement - Document Framework, April 2023 – Gagarin Studio (CMSF)
- Flood Risk Assessment, May 2023 – Curtins (FRA)
- Drainage Strategy Report, May 2023 – Curtins (DSR)
- Drainage Strategy Drawing 1 of 2, 081617-CUR-01-ZZ-D-C-92001 – May 2023, Curtins (DSD1)
- Drainage Strategy Drawing 2 of 2, 081617-CUR-01-ZZ-D-C-92002 – May 2023, Curtins (DSD2)

19. Reference has also been made to the HRA of 'England Coast Path Proposals between Silecroft in Cumbria and Cleveleys in Lancashire' (Natural England, 2020); part of the England Coast Path extends through Hodbarrow Reserve, along the sea wall (seaward side) and the south-east boundary of the reserve.

20. The Conservation Objectives for the Morecambe Bay SAC and for the Morecambe Bay and Duddon Estuary SPA, and the citation for the Duddon Estuary Ramsar were also examined (Appendix 1).

21. Recommendations for precautionary avoidance measures to be conditioned in any planning permission that may be granted have been made in the sALSE table, and highlighted with italicised text.

Is the proposal directly connected with or necessary to the management of the site for nature conservation?

22. No, the proposal is not directly connected with or necessary to the management of the site for nature conservation.

POTENTIAL IMPACTS ON THE INTEREST FEATURES

TEMPORARY/CONSTRUCTION PHASE - Are the interest features exposed to potential hazards during the construction period?

INTEREST FEATURE	POTENTIAL HAZARD	AVOIDANCE OF IMPACT	SIGNIFICANT ALONE Y/N
All estuary SAC habitats; natterjack toad habitats (Ramsar)	**Physical damage, habitat loss/modification to SAC/Ramsar** e.g. Direct damage to SAC habitats and adjacent land, and to natterjack toad habitats from ground preparation works, vehicular access, use/storage of plant and machinery and storage of other materials.	The proposed development of the welcome building and car park for the Iron Line will be confined to the site adjacent to the north-east of Hodbarrow Reserve, which lies outside the designated SAC and Ramsar area. Botanical survey work of this area undertaken by Joshua Styles in 2022 did not find any Annex 1 habitats present on the welcome building/car park site that are included as interest features of the SAC. Therefore, physical damage or habitat loss/modification to the SAC or Ramsar connected with works for the welcome centre and car park is not expected. The Iron Line on Hodbarrow Reserve has been designed carefully to avoid impacts on designated features, such as the habitats of the SAC/Ramsar. The botanical survey work undertaken by Joshua Styles in 2021 and 2022 on Hodbarrow Reserve identified a very small area of Annex 1 habitat that is a qualifying feature of the Morecambe Bay SAC (H2130 – fixed coastal dunes with herbaceous vegetation (grey dunes)) within the 20m buffer survey area, in the southern part of the reserve (p70, BSR). This Annex 1 habitat is adjacent to the eastern side of the byway open to all traffic (BOAT) around the point that the BOAT extends westwards along the sea wall (known as Whiterock Junction). The PEA survey findings (App 1, drawing 2363 E1-B, PEA, 2021) indicate that the dune habitat is likely to extend further over this area in the southern part of the reserve, covering an area of approximately 0.3ha. The scheme has been designed in close liaison with NE, RSPB and ecological consultants to avoid	N

		ecological impacts during construction wherever possible, such as impacts on Annex 1 habitat on the site. For example, earthworks that were proposed on the BOAT directly adjacent to the Annex 1 fixed dune habitat to create a mound to prevent vehicles from accessing the dunes have now been removed from the plans due to concerns about potential impacts of the works on the fixed dunes, so that a buffer will now be left between works along the BOAT and the dune habitat. Instead of earthworks in this area, large boulders or similar will be placed along the outside edge of the habitat to prevent vehicles accessing the dunes. The small bund proposed to the north of the footpath along the sea wall will also be extended into Whiterock Junction to further prevent vehicles from driving south/east-wards from the BOAT into dune habitat. All works (including contractors' lay down areas) will be confined to the existing extent of the BOAT/main path across the reserve where there is currently hardstanding/bare ground, with the exception of the surface water drainage works. The EcIA states (5.2), 'the cited Annex 1 H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat will not be lost as a result of the formalisation of the paths and therefore no direct impacts are predicted'. The surface water drainage scheme, which includes the addition of surface water sewers draining by gravity from the welcome building/car park westwards into the lagoon, manholes, and headwalls, and the excavation of two swales, will be located in dense scrub habitat in the northern part of the reserve, approximately 760m north of the SAC designated Annex 1 fixed dunes habitat on the reserve (DSD1). As a precaution to further avoid any impacts, important habitats that are adjacent to the work areas, such as the Annex 1 grassland habitat and fixed dunes, will be protected by temporary herras fencing during all construction works to	N N

		prevent destruction or disturbance/trampling of the habitat by machinery, workers or materials. The re-surfacing works (and working area) along the route near the fixed dunes habitat, that extends from the BOAT south-east to the windmill, will be confined to the existing trampled desire-line, which varies between c.4-10m wide where it crosses the fixed dunes. Temporary herras fencing will be used along the desire line to protect the adjacent habitat. All construction workers will be fully briefed prior to works commencing on the importance of avoiding these habitats during works during the toolbox talk and via the CEcMP (7.1, EcIA).	N
		In 7.2 of the EcIA it is also stated, 'prior to works commencing (inclusive of site clearance or devegetation works), temporary fencing will be erected around all new and retained features, including waterbodies, dune habitats and grasslands, to delineate no go areas for workers and machinery.'	N
		It is suggested within the botanical survey report produced by Joshua Styles that another Annex 1 habitat that is a qualifying feature of the SAC may be included in the reserve, that of H1150 – coastal lagoons. However, the report states that, 'a full inspection of coastal lagoons was not able to be undertaken (see section 4.2) and no indicators of salinity were evident at the time of 2021 or 2022 surveys.' Further information provided by the RSPB about this from their Annual Report 2012/13 suggests that the lagoon is unlikely to qualify as an Annex 1 habitat due to a lack of salinity; '"conductivity monitoring was carried out this year giving an average lagoon reading of 1500µS – showing that the margins and surface at least are practically fresh water rather than brackish." We went round with a hand held meter and dipped in in the water around the lagoon edges, but do not have any readings at depth from within the lagoon.' (Email from Dave Blackledge dated 23rd March 2022).	N

		The proposed works are not expected to directly impact on the lagoon or large waterbodies on site, as works will be confined to the BOAT/main path around the reserve, apart from two small hides that will be constructed on the shore near the eastern edge of the lagoon, which will not directly impact on lagoon habitat. The findings of survey work undertaken by Tyrer Ecological Consultants Ltd in 2021 and 2022 did not indicate that Natterjack toads are breeding on Hodbarrow Reserve, and the species' presence was not confirmed on the reserve or adjacent welcome building/car park site during the survey work. However, there are past records (and more recent incidental observations evidenced by photographs) of Natterjack toads from both the welcome building/car park site and the main reserve, and their presence in pools on land directly adjacent to the south-east of the reserve during the breeding season was confirmed during the survey work in 2021 and 2022. The habitats within the reserve and on the proposed welcome centre site are not ideal for Natterjack toads currently, mainly due to the presence of dense scrub across much of the area and the disturbed nature of the smaller waterbodies on the reserve, being located near well-used paths and being regularly accessed by dogs, for example. Due to the ecological importance of the site, works have been designed carefully to avoid impacts on the most important habitats. These important areas include the waterbodies, grassland and dune habitats, which are also habitats with the most potential to support natterjack toads if they were present on site. On the reserve, works, including contractors' lay down areas, will be confined to the existing width of the BOAT and main path to avoid impacts on adjacent habitats with potential for natterjack toads. On the adjacent welcome building/car park site, works, including contractors' lay down	N

		areas, will mainly be confined to the existing tarmac road and dense scrub areas, which are less likely to support natterjack toads (if they were present on the site) than the open grassland areas, which will be protected. Therefore, it is unlikely that the proposed Iron Line works on Hodbarrow Reserve and the adjacent welcome building/car park site will have a significant effect on any estuary SAC habitats or habitats that may be used by natterjack toads during construction. *All of the avoidance measures detailed above, in the project design and in documents including the 'Construction Ecological Management Plan' (CEcMP) to prevent impacts on the protected sites during construction, such as protection of SAC habitat, should be implemented and monitored regularly during construction.*	N N
Non-breeding SPA bird species: Golden Plover, Bar-tailed Godwit, Whooper Swan, Little Egret, Black-tailed Godwit, Ringed Plover, Pink-footed Goose, Redshank, Curlew, Oystercatcher, Knot, Pintail, Dunlin, Ruff, Ruddy Turnstone, Mediterranean gull, Lesser black-backed gull, Shelduck, Grey Plover, Sanderling, **Breeding SPA bird species:** Sandwich tern, Lesser black-backed gull, Herring gull, Common tern, Little tern	**Physical damage, habitat loss/modification to SPA** e.g. Direct damage to bird feeding/nesting habitat from ground preparation works, vehicular access, use/storage of plant and machinery and storage of other materials.	Works (including contractors' lay down areas) will be confined to the existing extent of the BOAT/main path across the reserve (and to the proposed adjacent welcome building and car park site), or to the area of dense scrub in the northern part of the reserve (surface water drainage scheme). Therefore there will not be any direct physical damage or habitat loss/modification to the habitats used by the Morecambe Bay and Duddon Estuary SPA qualifying species during construction. It is stated in the EcIA (5.2) that, 'the area proposed for the visitor centre and carparking lies outside the designation boundaries. The qualifying species of the Ramsar and SPA sites are primarily seabirds associated with the lagoon located at 200m from the area proposed visitor centre and carparking. None of the habitats of the SAC have been recorded on site during the 2022 surveys, and none of the qualifying bird species of the Ramsar and SPA have been incidentally recorded on site during other survey work. This, and the lack of large waterbodies or estuary	N

		habitats on the visitor centre site, indicate that the site does not represent functional land used by bird species associated with the Ramsar and SPA.' All coastal habitats, the lagoon, large waterbodies and the tern island (i.e. habitats that may be used for feeding/roosting/nesting by SPA species) will remain outside of the area of works and will therefore not be directly damaged/modified by works and will not be used for storage of plant, machinery or materials. Therefore, it is considered unlikely that the proposed works would cause a significant effect on the SPA through direct impacts on SPA bird habitats during construction activities.	N N N
All estuary SAC habitats	**Channel modification and changes in flow & geomorphology impacts on SAC** e.g. In-channel works leading to reinforcement/hard engineering or other modification of the river channel; interruption or change in river/estuary flow and interference with sedimentation and general geomorphological processes.	Works will be confined to the BOAT/main path across the reserve (and to the proposed adjacent welcome building and car park site), or to the area of dense scrub in the northern part of the reserve (surface water drainage scheme). Therefore, there will not be any channel modification and changes in flow and geomorphology impacts on the Morecambe Bay SAC during construction.	N
All estuary SAC habitats	**Impacts on water quality of SAC - Turbidity/Siltation** e.g. Siltation, sedimentation and other polluting run-off and contamination reaching the estuary from excavation and ground preparation works and other ground disturbance. Elevated levels of suspended solids can clog the respiratory structures of fish	The proposed works will be confined to the BOAT/main path across the reserve, to the adjacent welcome building and car park site and to the area of dense scrub in the northern part of the reserve (surface water drainage scheme), areas which do not appear to be directly hydrologically connected to the SAC estuary habitats. With regard to the excavation and exposure of potential ground contamination, the main area that will be subject to major excavation works will	N

	species and aquatic plants, stunting growth and affecting the quality of habitat.	be the proposed welcome building/car park site. Some excavation will also be required to install the surface water drainage scheme in the northern part of the reserve (DSD1). The Preliminary Risk Assessment states (section 8.0, PRA) that, 'the qualitative risk assessment (QRA) determined a varied level of risk associated ground/groundwater contamination and ground gas risk with respect to the proposed development, Moderate to Low to Moderate risks were identified for potential contaminant linkages. The QRA concluded by recommending that generic quantitative risk assessments (GQRA) were conducted to confirm the assessment of risk ascribed to each of the respective potential pollutant linkages (PPLs). It is recommended that the GQRA is conducted as part of a ground investigation in support of the engineering design of the proposed development.' The PRA also recommends (section 8.0), 'subject to findings of ground investigation, undertake a Remediation Strategy outlining required remedial actions and subsequent validation/completion report.' It is stated in the EcIA (5.2) regarding the welcome building/car park site, that 'given the proximity of the statutory site boundary, which lies immediately next to the development footprint, indirect impacts could be in the form of pollution events such as dust deposition, additional run-off, vibration and noise etc. Given the distance between the habitats supporting qualifying species (lagoon) and the nearest cited Annex 1 H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) approximately 600m southwest, it is unlikely that pollution events would impact the qualifying reasons for designation.' Construction works (and working areas) on the main path/BOAT on the reserve will be located in close proximity (<20m) in places to waterbodies on the reserve, such as near the lagoon in the north-west part of the reserve, in the eastern area	N N

		where the BOAT passes between the two large waterbodies on the reserve, and along the sea wall. A headwall and an outfall will also be installed on the north-east bank of the main lagoon as part of the surface water drainage scheme (DSD1). From examination of the online OS map, there do not appear to be any direct hydrological connections between these waterbodies on the reserve and the estuary. The lagoon is contained within the sea wall, with no apparent hydrological connectivity with the estuary directly adjacent to the south of the sea wall, also evidenced by the lack of salinity of the lagoon (please also refer to comments regarding salinity of lagoon above on page 10). However, works will be undertaken to the BOAT running along the sea wall, where there may be the potential for contaminated runoff to enter the adjacent estuary to the south during works (intertidal sand habitat) and also potentially the qualifying Annex 1 habitat on site at Whiterock Junction (coastal fixed dunes). Regarding the main reserve, the EcIA states (5.2), 'the Annex I H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat and the lagoon which supports the qualifying populations of birds could also be subject to habitat degradation through pollution events as well as trampling and spreading of invasive species)'. It is understood that excavation works along the sea wall will be minimal, as the BOAT on the sea wall will not be re-surfaced, instead the surface will be 'made good' by scraping and in-filling large potholes/ruts with scraped material. Considering the temporary nature and the relatively small scale of works proposed along the sea wall/BOAT, it is considered unlikely that any contaminated runoff that may enter the SAC habitats during works would significantly impact the SAC estuary habitats. However, as a precaution, the EcIA states (7.1)	N N

		that, 'to ensure best practice is implemented during the construction phase and existing retained habitats on site and ecological receptors are protected, a CEcMP will be compiled prior to works commencing and secured through planning condition.' The CEcMP will include control measures for the storage, handling and management of materials and waste, which would help to protect the SAC from potential impacts of turbidity/siltation during construction, such as: • Materials and waste to be stored in a commercial skip sited within the works compound before removal from site. Waste containers to be securely covered to ensure wastes cannot be blown or washed away. • Any oils, fuels and liquids used will be appropriately labelled and will be securely stored within the site compound (storage to include bunding and tamper proof and lockable valves, as appropriate). • Spill kits to be located near to the works areas and within storage compounds, with personnel being trained in their use. Daily walkover will be undertaken to collect other material. In 7.2 of the EcIA regarding designated sites, it is also stated that, 'zones for the piling of soil or storage of materials associated with the development will be clearly defined and on existing areas of hardstanding. Fuel, oil and other chemicals will be stored in appropriate containers that are impervious to the material being stored also stored on areas of existing hardstanding with bunding. Leaking and empty containers will be removed from the site immediately.' The Construction Method Statement Framework (CMSF) also includes sediment control measures and contaminated land remediation.	N N

		Therefore, it is unlikely that the proposed Iron Line works on Hodbarrow Reserve and the adjacent welcome building/car park site will have a significant effect on any estuary SAC habitats through impacts on water quality of turbidity/siltation during construction. *All of the avoidance measures detailed above, in the project design and in documents including the 'Construction Ecological Management Plan' (CEcMP) and CMSF to prevent impacts on the protected sites during construction, such as those listed above, should be implemented and monitored regularly during construction.*	N N
All estuary SAC habitats	**Impacts on water quality of SAC - Toxicity** e.g. Pollution of the estuary arising from batteries, fuel and other chemicals stored near the estuary/on the floodplain. Pollution of the estuary arising from disturbance of contaminated land and release of toxic contaminants.	Please refer to comments above re. impacts of turbidity/siltation, which are also relevant with regard to impacts of toxicity on SAC habitats during construction. Precautionary measures are included in the EcIA to avoid pollution (7.1); 'to ensure best practice is implemented during the construction phase and existing retained habitats on site and ecological receptors are protected, a CEcMP will be compiled prior to works commencing and secured through planning condition.' The CEcMP will include control measures for the storage, handling and management of materials and waste, which would help to protect the SAC from potential impacts of toxicity during construction, such as: • Materials and waste to be stored in a commercial skip sited within the works compound before removal from site. Waste containers to be securely covered to ensure wastes cannot be blown or washed away. • Any oils, fuels and liquids used will be appropriately labelled and will be securely stored within the site compound (storage to include bunding and tamper proof and lockable valves, as appropriate).	N

		• Spill kits to be located near to the works areas and within storage compounds, with personnel being trained in their use. Daily walkover will be undertaken to collect other material. In 7.2 of the EcIA regarding designated sites, it is also stated that, 'zones for the piling of soil or storage of materials associated with the development will be clearly defined and on existing areas of hardstanding. Fuel, oil and other chemicals will be stored in appropriate containers that are impervious to the material being stored also stored on areas of existing hardstanding with bunding. Leaking and empty containers will be removed from the site immediately.' The CMSF also includes waste and material management and pollution control measures. Therefore, it is unlikely that the proposed Iron Line works on Hodbarrow Reserve and the adjacent welcome building/car park site will have a significant effect on any estuary SAC habitats through impacts on water quality of toxicity during construction. *All of the avoidance measures detailed above, in the project design and in documents including the 'Construction Ecological Management Plan' (CEcMP) and CMSF to prevent impacts on the protected sites during construction, such as those listed above, should be implemented and monitored regularly during construction.*	N N
All estuary SAC habitats	**Introduction of invasive, non-native species to SAC** e.g. Risk of introducing and/or spreading invasive non-native species (e.g. Himalyan balsam, Japanese knotweed, *Crassula helmsii, Dikerogammarus villosus*)	It is stated in the PEA report (2021) that invasive and non-native species, including cotoneaster species, Japanese knotweed, variegated yellow archangel and montbretia are present on the reserve, along with the invasive species sea buckthorn. The PEA survey (2022) of the welcome centre and car park site adjacent to the reserve found cotoneaster to be present on the site. There is potential for these species to be spread further across the site by soil disturbance along	

		the BOAT/main path, works for the drainage scheme and by construction vehicle movements increasing seed dispersal, for example. There is also potential for the introduction/spread of invasive species to/from the site during construction works, for example through importing fill material from elsewhere and through a lack of wheel washing of vehicles entering/leaving the site. It is stated in the EcIA (7.1) that, 'the invasive species will be removed by specialist contractors and disposed of following best practice guidance. Bio-security principals inclusive of works exclusion zones will be followed throughout the construction to prevent the spread of invasive species.' In 7.2 of the EcIA it is stated, 'prior to works commencing (inclusive of site clearance or devegetation works), temporary fencing will be erected around all new and retained features, including waterbodies, dune habitats and grasslands, to delineate no go areas for workers and machinery. Temporary fencing will also be erected around stands of invasive species at this stage to ensure works do not inadvertently advance the spread of invasive species within the site.' It is also stated in the EcIA (7.1) that the CEcMP will include the following measures to reduce the risk of invasive species spreading or being introduced to the SAC: • 'Biosecurity protocols such as thorough wheel washes and invasive species works exclusion zones enforced by fencing and signage (3m zones for all invasive species present on site except for Japanese Knotweed, which is 10m WEZ) to be followed to prevent non-native/invasive species from spreading.' The CMSF also includes management and control of invasive species.	N N N

		Therefore, it is unlikely that the proposed Iron Line works on Hodbarrow Reserve and the adjacent welcome building/car park site will have a significant effect on any estuary SAC habitats through impacts of non-native invasive species during construction. *All of the avoidance measures detailed above, in the 'Construction Ecological Management Plan' (CEcMP) and the CMSF that will help to prevent impacts on the protected sites from non-native invasive species during construction, such as those listed above, should be implemented and monitored regularly during construction.*	N
Non-breeding SPA bird species: Golden Plover, Bar-tailed Godwit, Whooper Swan, Little Egret, Black-tailed Godwit, Ringed Plover, Pink-footed Goose, Redshank, Curlew, Oystercatcher, Knot, Pintail, Dunlin, Ruff, Ruddy Turnstone, Mediterranean gull, Lesser black-backed gull, Shelduck, Grey Plover, Sanderling, **Breeding SPA bird species:** Sandwich tern, Lesser black-backed gull, Herring gull, Common tern, Little tern, Mediterranean gull	**Disturbance to SPA species** e.g. General disturbance (noise, vibration, lighting, activity, etc.) in/nearby the estuary causing a barrier, displacement and preventing passage.	It is understood from information provided by the RSPB (email from Dave Blackledge dated 8th March 2023), that outside the breeding season the lagoon and tern island are used by the following bird species: red breasted merganser, eider, tufted duck, goldeneye and coot. Several SPA species use the tern island to roost in good numbers at high tides mainly between autumn and spring, as follows (with peak counts from 2022 in brackets): dunlin (151 in January), knot (540 in April) and redshank (430 in April). Breeding bird data provided by the RSPB (email from Dave Blackledge on 23rd March 2023) includes the following numbers of pairs of SPA species recorded from the lagoon in 2022: common tern (54), herring gull (7), lesser black-backed gull (27), little tern (44), and sandwich tern (589). Peak counts of breeding pairs of these species between 1988 and 2020 are as follows: common tern (50 in 1998), herring gull (37 in 2020), lesser black-backed gull (258 in 2009), Mediterranean gull (1 in 2019), little tern (48 in 2016) and sandwich tern (1950 in 2018) (data provided by Dave Blackledge on 8th March 2023). It is understood that the majority of the gulls breed on/near the old sea wall, and the majority of the terns breed on the island on the south shore of the lagoon.	

		It is understood that piling will be required for the construction of the welcome building on the site adjacent to the reserve. The extent of piling required is currently unknown at the time of writing the report. The welcome building/car park site is located approximately 225m north-east of Hodbarrow lagoon at its closest point, approximately 600m north-east of the old sea wall, and approximately 900m north-east of the tern island. The recycling centre is located adjacent to the welcome building site, which generates existing visual activity (car and lorry movements along the access road) and noise in this area. There are large areas of dense scrub situated between the welcome building site and the lagoon, which would help to attenuate noise and reduce visual disturbance to SPA species from construction works on the welcome building site. Additionally, the welcome building and car park are located to the north-east of the areas used by SPA species (lagoon, old sea wall and tern island); as the prevailing wind is south-westerly, it is likely that the wind would mainly carry construction noise to the north, away from the sensitive areas of Hodbarrow. Therefore, it is not expected that construction works on the welcome building and car park site would significantly impact SPA species that would be present on Hodbarrow Lagoon/old sea wall/tern island during summer or winter through disturbance, given the acoustic attenuation of construction related noise at these distances. Whilst proposed works on the reserve itself to improve access will not involve activities that generate as much noise and vibration as piling, they will require machinery and vehicles that will create noise and vibration, in addition to visual disturbance of moving vehicles and workers. Some of the works on the reserve will also be situated in much closer proximity to the SPA species than works on the welcome building site,	N

		such as those along the sea wall, at the eastern end of the old sea wall, near the eastern shore of the lagoon (closest distance of path/BOAT is c. 10m from the lagoon at the northern end of the reserve) and the installation of the surface water drainage scheme including a headwall and outfall on the eastern bank of the lagoon. The EcIA states (5.5), 'of the qualifying species, common tern, sandwich tern and little tern are known to have medium to high susceptibility to human disturbance within the breeding season which can lead to colonies abandoning their nests and cause colonies to move and decrease breeding success. Recommended buffer distances for human disturbance during the breeding season is considered to range from 100-400m for tern species. There is limited research on the recommended buffer zones for breeding colonies of Herring gulls and lesser black-backed gull's perhaps due to the fact they are known to nest in heavily urban environments.' The EcIA also states (5.5), 'additionally, studies undertaken by Wright et al. (2010), Dooling and Popper (2007) and Cutts et al. (2009) suggest changes in bird behaviour and flight abandonment can begin to occur at chronic noise levels of 55-65dBA, with sudden irregular noise above 50dBA causing the most disturbance. The studies also showed that ambient construction noise levels should be restricted to below 70dBA as birds will habituate to regular noise below this level. The exact machinery for the works is yet to be determined however typical construction plant and noise levels for similar works are likely to range between 109.4dBA- 111.5dBA at source.' Construction activities along the sea wall and near the lagoon are also likely to cause disturbance through noise and vibration to over-wintering SPA species. The EcIA states (5.6), 'in the absence of mitigation, construction associated with formalising the paths on site, in	Y Y

		particular the BOAT along the seawall, restoration of the existing bird hide and construction of the hide along the old sea wall has potential to indirectly disturb the qualifying species through a range of pathways including noise, vibration and pollutant spillage. Disturbance from long-term construction works are known to impact several of the overwintering bird species present. Disturbance can have negative physiological costs such as increased heart rate and stress hormones as well as negative energetic costs from the reduced foraging time or flying away from the site of disturbance. Please refer to section 5.5 above for information on likely noise levels from construction activities and disturbance impacts on birds, which are also of relevance to wintering birds.' A table of the recommended buffer zones for qualifying species is also provided in the EcIA (5.6). The EcIA also states (5.6), 'the majority of the buffer zones have been NatureScot's literature review of disturbance distances of selected bird species and the 'human disturbance' covers activities such as pedestrian walking to motorboats out at sea. Works to the old sea wall would fall within 15m of the lagoon which lies well below the lower threshold recommended for buffer zones. The impact of disturbance on the populations of birds that whole sites can support, however, depends upon the availability of alternative habitat. The lagoon forms a total of 50.24ha and the width of the lagoon varies between approximately 850m-1,300m across and forms a part of the wider Duddon Estuary and therefore birds have ample space to avoid construction without leaving the lagoon.' Therefore, in the absence of mitigation, it is not possible to rule out a significant effect on the integrity of the SPA through noise and vibration of construction works undertaken on the sea wall/on the reserve near the lagoon, particularly	Y

		to the breeding SPA species, but also to non-breeding SPA species. Therefore, disturbance during construction needs to be taken to the Appropriate Assessment stage of the HRA as required under the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations'), and mitigation secured to ensure a conclusion of no adverse effect on integrity.	Y
Natterjack toads (Ramsar)	**Injury or death of natterjack toads** e.g. by vehicular access, use of plant and machinery and storage of other materials	Please refer to comments above on pages 11 - 12 regarding the likely absence of breeding natterjack toads on the proposed development site, which are also of relevance here. It is stated in the EcIA (5.7) with regard to the welcome building/car park site and the wider reserve, that, 'given the proximity of works to confirmed areas supporting natterjacks (off-site) and the presence of an occasional transient/opportunistic natterjack using the site at certain times when dispersing/foraging cannot be entirely ruled out. This is supported by the desktop data which evidences biological records of natterjack toad seen on site as well as incidental observations reported to surveyors. Without due care and consideration there is therefore a potential risk for the killing or injuring natterjack toad as a result of the construction activity on site.' In addition to avoiding impacts on habitats adjacent to the tarmac road on the welcome building/car park site and adjacent to the BOAT/paths on the reserve, precautionary avoidance measures will be undertaken during works to ensure there are no impacts to itinerant natterjack toads during works, such as a suitably experienced and licenced ecologist providing a watching brief during works. For example, it is possible that an itinerant natterjack toad may be present on the BOAT during the spring/summer months, particularly if the deep ruts that are	N

		present in some areas of the BOAT's surface are holding water. The EcIA states in 7.7 regarding precautionary avoidance measures for natterjack toads on the welcome building/car park site and the wider reserve, 'a specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEcMP and LEMP as appropriate and would include the following: • Protect retained amphibian habitat with fencing; • Siting any piles of aggregate material away from areas of suitable amphibian habitat; • Construction works should check under machinery each morning for any animals before starting; • Any scrub vegetation will be cleared in a phased manner; and • An ECoW will be present to oversee works throughout key phases including precautionary site presences for any works associated with the ditch on site. • Amphibian gully pot ladders are recommended if any street drains will be installed. Therefore, it is unlikely that the proposed Iron Line works on Hodbarrow Reserve and the adjacent welcome building/car park site will have a significant effect on natterjack toads through injury or death during construction. *As a precaution, prior to the commencement of development works, an Amphibian Mitigation Plan should be submitted to and agreed, in writing, by the LPA, to include details of measures required during construction, such as those detailed in the EcIA and the CEcMP. RAMS for natterjack toads will need to be considered in conjunction with mitigation for reptiles.*	N

PERMANENT/OPERATIONAL PHASE - Are the interest features exposed to potential hazards after the construction period, when the development is permanent and operational?

INTEREST FEATURE	POTENTIAL HAZARD	AVOIDANCE OF IMPACT	SIGNIFICANT ALONE Y/N
All estuary SAC habitats; natterjack toad habitats (Ramsar)	**Physical damage, habitat loss/modification to SAC/Ramsar** e.g. Permanent loss/ transformation of estuary and/or in - channel habitat, by for example trampling of habitats by visitors and/or dogs defecating and urinating on habitats causing nutrient enrichment.	It is not anticipated that there will be any direct physical damage or habitat loss/modification to the Morecambe Bay SAC habitats during operation on the welcome building/car park site, as the findings of the botanical survey work undertaken in 2022 did not indicate the presence of any SAC qualifying habitats on the site. It is not anticipated that there will be any direct physical damage or habitat loss/modification to natterjack toad habitats during operation, either on the welcome building/car park site or on the wider reserve. This is because survey work showed likely absence of breeding natterjack toads from both areas, although there are records of occasional itinerant natterjacks on the sites. The proposals include positive habitat creation and management for natterjack toads, with the aim of attracting breeding populations to the reserve. This will be achieved by the creation of additional pools and scrapes on the reserve, by fencing of pools and scrapes to reduce disturbance by people/dogs, and by opening up large areas of dense scrub and by introducing conservation grazing to maintain open areas. It is stated in the EcIA (6.1) with reference to operational impacts on SAC habitats, 'the increase in visitors from 40,000 annually to 150,000 visitors annually increasing recreational pressure on site. The recreational pressure increases risk of habitat degradation through trampling from footfall, littering, dog foul and spreading of invasive species'. The EcIA also describes aspects of the project design that will minimise recreational impacts on the fixed dune SAC habitat on the reserve, such as the removal of the picnic bench from the dunes,	N N

		the provision of interpretation boards and dog waste bins, and fencing to protect the habitat and allow it to recover from existing trampling; it is stated (EcIA, 8.2), 'the Annex I habitat Fixed coastal dunes with herbaceous vegetation (grey dunes) is already subject to high levels of trampling from footfall. It is likely that the removal of the picnic bench will reduce the trampling in this area and it recommended that this is cordoned off and signage is provided to explain the importance of this habitat and allow it to recover. To address the increase in littering and dog waste there should be a provision of litter and dog waste bins across the site should be provided.'	N
		A boardwalk was proposed across the majority of the fixed dune habitat, to encourage people to stick to the path and to allow the habitat to recover. However, subsequent discussions with Natural England have indicated that a certain amount of trampling on sand dunes can be beneficial to the habitat, and boardwalks can encourage the development of unwanted vegetation, such as scrub. Therefore, a boardwalk will not be provided in this area, with low rails used instead to encourage visitors to stick to the main paths.	N
		Therefore, it is unlikely that the proposals will cause a significant effect on qualifying Annex 1 SAC habitat located in the southern part of the reserve (coastal fixed dunes) or on natterjack toad habitat by physical damage or habitat loss during operation. *A long-term Landscape and Ecological Management Plan (LEMP) should be prepared and agreed in writing by the LPA, to include the protection, management and monitoring of the Annex 1 habitats on site, such as the fixed dunes.*	N

Non-breeding SPA bird species: Golden Plover, Bar-tailed Godwit, Whooper Swan, Little Egret, Black-tailed Godwit, Ringed Plover, Pink-footed Goose, Redshank, Curlew, Oystercatcher, Knot, Pintail, Dunlin, Ruff, Ruddy Turnstone, Mediterranean gull, Lesser black-backed gull, Shelduck, Grey Plover, Sanderling, **Breeding SPA bird species:** Sandwich tern, Lesser black-backed gull, Herring gull, Common tern, Little tern	**Habitat loss/modification in SPA** e.g. permanent loss/modification of bird feeding/nesting habitat due to permanent structures	It is not anticipated that there will be any permanent habitat loss/modification of SPA bird feeding or nesting habitat during operation, as no permanent structures will be built in areas used by breeding and non-breeding SPA species. This is with the exception of the addition of a headwall and outfall on the north-eastern bank of the lagoon for drainage of surface water from the welcome building/car park site (DSR). It is understood that the outfall will be situated below the surface water level of the lagoon in order to not create any disturbance to wildlife when surface water is discharging at high flow rates. It is unlikely that the addition of these drainage structures will lead to any significant habitat loss/modification for SPA species. Please refer to previous comments on pages 20 - 21 above regarding the SPA bird species' use of the reserve, which are also of relevance here.	N
All estuary SAC habitats	**Geomorphological and floodplain changes to SAC** e.g. Risk of erosion/destabilisation of riverbank and adverse impacts on in-channel habitats from impact of permanent features. Floodplain issues - creation of need for flood defence works. Reduction in available floodplain for storage. Increased run-off rates due to catchment hardening.	It is understood that there will not be any channel modification and geomorphology impacts on the Morecambe Bay SAC during operation. It is understood from the DAS (section 4) that the majority of the new surfaces to be introduced as part of the Iron Line proposals will be self-binding gravel; on paths, and on the BOAT (apart from along the sea wall where the BOAT will not be re-surfaced, just scraped and filled). Considering that the existing surfaces in these areas on the reserve currently comprise hardstanding or compacted earth/mud, it is not expected that surface run-off rates would be significantly increased. In addition, the existing width of the majority of the paths/BOAT on the reserve will be narrowed to allow natural habitat to re-establish, which would reduce run-off in the longer term. For these reasons, impacts on the SAC habitat on site (fixed dunes adjacent to the BOAT/path at Whiterock Junction) due to increased surface run-	

		off are not expected. The welcome building has been designed with a living roof, and a living roof will be added to the existing tern hide, which will also contribute to reducing run-off from the proposals. On the welcome building/car park site, the existing macadum road to the recycling centre will be broken-up and replaced with a narrower footpath of self-binding gravel along the same route, with grassland habitat re-establishing along the path where the wider road used to be. A new macadum road will be created to the recycling centre in the north of the site, which will be shorter than the original road and therefore surface run-off from the road is likely to be somewhat reduced from existing. It is understood from the Drainage Strategy that percolation tests have shown that the welcome building/car park site is likely to be unsuitable for infiltration techniques to deal with surface water (to be confirmed by the Phase 2 ground investigations to be undertaken). A permeable pavement with impermeable tanking will be used in car park areas in order to contain and treat surface water on site to remove any contamination before it drains away. With regard to flood risk and floodplain issues, the Flood Risk Assessment states, 'the site has been assessed to lie across Flood Zone 1, Flood Zone 2 and Flood Zone 3 by reference to the Environment Agency Flood Map for Planning. A further review of the Copeland Strategic Flood Risk Assessment confirms the Flood Zone 3 area to be Flood Zone 3a. By reference to NPPF Annex 3, the Welcome Building is to be located in an area of the site designated as Flood Zone 1, is classed as Less Vulnerable and therefore, in accordance with NPPF PPG Table 2 (Reference ID: 7-079-20220825) is concluded to be appropriate within this Flood Zone. The other elements of the proposed development are determined to be Water	N N N

		Compatible and therefore, in accordance with NPPF PPG Table 2 (Reference ID: 7-079-20220825) are concluded to be appropriate within all Flood Zones within the site.' (FRA, section 8.0). The flood risk assessment (FRA) undertook a review and quantified the risk of flooding from all sources and concluded that the risk of flooding to and from the site from all sources is either 'none', 'very low' or 'low', with the exception of tidal flooding to the site, which is 'high' and surface water flooding to the welcome building lower car park, which is also 'high'. The FRA concludes that, 'with the exception of dealing with surface water flood risk to the site specifically to the area proposed for the Welcome Building Car Park, no further mitigation is required for other sources of flood risk by this assessment. In respect to surface water flooding from the site, post-development, a Surface Water Drainage Strategy has been developed as part of the accompanying documents for a planning submission. Fluvial and Tidal Flood Risk has been assessed on what the EA advise to be the most relevant information to the site. In accordance with current Environment Agency Guidance, Finished Floor Levels should be set, where possible, be a minimum of 300mm above the Design Flood Level. It is recommended that Finished Floor Levels are set no lower than **7.23mAOD**.' (FRA, section 8.0). Regarding the surface water drainage strategy, the Drainage Strategy Report states that, 'currently any overland flow will follow the sloping topography down to the east and west. There will be some infiltration and some absorption from the vegetation which will also slow any overland flows. An existing tidal lagoon is located approximately 250m southwest that is a potential surface water outfall.	N N

		Former Redhills quarry now naturally filled pond/pool to the north is located approximately 70m from the site. Runoff from the existing catchment is mainly drained to east where the lower lying ground levels are. From here it would drain to the north as the ground levels drop away slightly. This is where the quarry pool/pond is located and which would be the natural flow path. Runoff from the top part of the site would also drain to the south and west towards the tidal lagoon following the sloping topography. The proposed discharge points to these two locations will be restricted up to the 1:100 year rainfall to a 1:1year Greenfield runoff rate. Therefore, the change to a point discharge is not considered to adversely impact the waterbodies.' (DSR, section 4.1). 'The site will be split into two catchments from a proposed drainage perspective. This is considered the most sustainable strategy to avoid subtracting available volume from the fluvial flood path. Rates of surface water discharge will be controlled.' (DSR, 4.2). 'The site will be divided into catchments to suit site constraints so that the total surface water discharge for catchment 1 (lagoon) does not exceed 4.00 l/s (litres/second) for all storms up to and including the 1:100 year plus climate change event.' (DSR, 5.1). 'All surface water discharge shall be restricted to the 1:1 year greenfield rate from each catchment. Runoff from the 1:30 year event should be attenuated below ground (i.e. not cause flooding) and the 1:100 year should be attenuated on site without posing a risk to people or property. The site lies in the Southwest Lakes Management Catchment, for the EA guidance[5] on peak rainfall allowances. Therefore, attenuation will be provided for the 1:30 year +35% climate change	N N N

		and the 1:100 year +35% events, based on a 60 year design life.' (DSR, 4.3). Therefore, it is unlikely that the proposed development would significantly impact SAC features through geomorphological and floodplain changes, providing that the drainage strategy is implemented in full, and that recommendations to avoid potential impacts on wildlife are also implemented, such as the use of amphibian gully pot ladders in any street drains installed.	N N
All estuary SAC habitats	**Water resources.** e.g. Abstraction and discharge can have direct implications for river flow (e.g. water supply for large developments or certain types of development - ref also cumulative/ in-combination impacts).	Please refer to comments above regarding surface water drainage, which are also of relevance here. It is stated in the Drainage Strategy Report that, 'there will be a requirement for water at the Welcome Centre. It is thought that this will be supplied from a reliable water source.' (DSR, section 3.0). Impacts on water resources are not expected from the proposals and therefore significant effects on estuary SAC habitats are not anticipated due to abstraction or discharge.	N N
All estuary SAC habitats	**Water Quality of SAC: Drainage and Discharge** e.g. Siltation and decrease in water quality from soakaway if situated too near to estuary. Foul drainage - Waste Water Treatment Works - capacity issues for large developments (mains sewer or package plant - quality of discharge to river wrt targets defined in conservation objectives). Surface water drainage can	With regard to the protection of the water quality of the SAC, the Drainage Strategy Report states the following: 'surface Water runoff areas at risk from contamination should receive water quality treatment. The development land uses can be categorised as follows. The simple index approach has been used from C753. The pollution hazard indices from Table 26.2 are: Building roofs = Low hazard, TSS: 0.3, metals: 0.2, HCs:0.05 Car parking and site roads = Medium hazard, TSS: 0.7, metals: 0.6, HCs: 0.7' (DSR, 4.3).	

	lead to a reduction in water quality from silt-laden run-off and pollutants.	'The proposed surface water drainage and route to the (lagoon) outfall will consist of a mixture of permeable paving, proprietary treatment units where possible and a series of cascading swales/conveyance swales utilised. Swales are to incorporate biodiversity feature where possible i.e., shallower gradients and low flow channel. Ecologically sensitive areas are to be avoided due to protected grassland/plants. Closer to the lagoon is where the topography is the steepest and the drainage route will most likely be piped. We have modelled the outfall as a surcharged outfall which will help to take any force out for the piped water flow and reduce any erosion.' (DSR, 4.5). 'Surface water treatment from this catchment (for discharge to Redhills quarry) is provided by stone filled filter trenches, permeable construction and propriety units where possible. The permeable construction provides the attenuation for this catchment to allow restriction back to the 1:1 year greenfield runoff rate for all storm up to and including the 1:100 year + climate change event. Connection to the quarry will be via a newly formed drain or open channel/swale adjacent to the access road.' (DSR, 4.5). 'Flows from the site roads have a medium pollution hazard so require two stages of treatment. This is recommended to be a proprietary treatment system followed by a 'polishing' open SuDS system, such as a pond or swale. The choice of proprietary system will affect the type and scale of the open SuDS system. Other methods of initial treatment include the use of Trapped Gullies and Catchpit chambers, which may be used to filter out high volumes of sediment and aid maintenance. Runoff from roofs can be effectively treated by any one SuDS feature.	N N N

		Permeable paving, a downstream defender and series of cascading swales are proposed as a final stage of treatment for catchment 1 (lagoon) and filter drains and permeable paving are proposed for Catchment 2 (quarry). The type(s) of mitigation proposed may be further considered as the site design is finalised i.e., paving surfaces etc. The proposals for pollution protection should be agreed with the lead local flood authority (LLFA).' (DSR, 5.4). With regard to foul drainage, the following strategy is proposed: 'A separate foul water drainage system is proposed for the site. This is to drain via a gravity system and through a suitable package treatment plant to the east before it connects to the proposed surface water outfall. From here it will drain out to the former quarry pool/pond. Effectively a treated combined water outfall to the waterbody. We expect the development runoff to be circa 0.2 l/s (British Water Foul Flows and Loads – Code of Practice). The flow rate from the foul has been factored into the overall allowable 1:1 year greenfield discharge rate and the surface water rate reduced to accommodate the foul flow. We have held meetings and had discussions with the LLFA during the pre-app advice period and agreed the drainage philosophy in principle.' (DSR, 6.0). Therefore, it is unlikely that the proposed development would significantly impact SAC features through impacts from drainage and discharge on the water quality of the SAC, providing that the proposed drainage strategy is implemented in full.	N N N N

All estuary SAC habitats	**Introduction of invasive non - native species** e.g. Risk of introducing and/or spreading invasive non-native species (e.g. Himalayan balsam, Japanese knotweed, *Crassula helmsii, Dikerogammarus villosus*)	Please refer to comments above (page 19) regarding the presence of invasive non-native species on the reserve and welcome building/car park site, which are also of relevance here. It is stated in the EcIA (6.1) with reference to operational impacts, 'the increase in visitors from 40,000 annually to 150,000 annually increasing recreational pressure on site. The recreational pressure increases risk of habitat degradation through trampling from footfall, littering, dog fouling and spreading of invasive species'. The EcIA also states (8.2), 'whilst invasive species will be removed from site as part of the proposals opportunities for spreading of invasive plants may still arise from the footfall of visitors. As part of on-going management actions of the site should include monitoring for the spreading of invasives. Remedial actions will involve the removal of any invasives noted during the monitoring.' Therefore, it is unlikely that the risk of spreading/introducing invasive species during operation would have a significant effect on the integrity of the SAC. *A long-term Landscape and Ecological Management Plan (LEMP) should be prepared and agreed in writing by the LPA, to include the management and monitoring of invasive species on site.*	N N
Non-breeding SPA bird species: Golden Plover, Bar-tailed Godwit, Whooper Swan, Little Egret, Black-tailed Godwit, Ringed Plover, Pink-footed Goose, Redshank, Curlew, Oystercatcher, Knot, Pintail, Dunlin, Ruff, Ruddy Turnstone,	**Disturbance to SPA species** e.g. General operational disturbance (noise, vibration, lighting, activity, etc) near the SPA causing a barrier, displacement and preventing passage.	Please refer to comments above on pages 20 - 24 regarding disturbance impacts on SPA bird species, some of which are also of relevance here. The EcIA states (6.5) in relation to operational disturbance to breeding SPA species, 'proposals estimate peaks of 150 visitors per hour over the course of a day during peak periods (school holidays, warm weather); currently visitor numbers at these times are estimated to be 50 people per hour. The increase in visitors has	

Mediterranean gull, Lesser black-backed gull, Shelduck, Grey Plover, Sanderling, **Breeding SPA bird species:** Sandwich tern, Lesser black-backed gull, Herring gull, Common tern, Little tern		potential to increase the frequency of human disturbance to breeding terns and gulls. This can affect the breeding success of birds in a variety of ways including reduced intake of food, increased energy expenditure, physiological impacts such as increased stress and direct impact through predation by domestic dogs. The 0.5ha tern island was created within 100m of the existing BOAT, which lies closer than the recommended human disturbance buffer zones for tern species (ranging from 200-400m). The fact that successful breeding colonies can exist within this range is likely due to a combination of the following: • presence of a tern warden during the breeding season protecting the terns from disruptive behaviour by site users; • creation of a bund which screens the majority of movement by site users from the terns; • presence of anti-predator fencing; • the terns have likely developed some level of habituation to human disturbance; and • existing site users are aware of the importance of the tern colonies and respectfully adhere to rules. All of these factors contributing to breeding success will continue alongside the implementation of the proposals. Nonetheless, in the absence of mitigation, the increase in visitors could result in a **Permanent Negative (Significant) Impact at an International Level**. There is less available information on the impacts of human disturbance on breeding herring gulls and lesser back backed gulls perhaps due to the fact they are known to nest in heavily urban environments indicating they may have a higher tolerance towards human disturbance. As a precaution, in the absence of mitigation, the increase in visitors could result in a **Permanent**	

		Negative (Significant) Impact at an International Level.' With regard to operational impacts on over-wintering SPA bird species, it is stated in the EcIA (6.6), 'the site is already subject to some disturbance from site users however the proposals will seek to increase visitors which is predicted to equate to 410 people each day if spread evenly across the year. The buffer zones for human disturbance for the non-breeding bird species range from 200m to 1000m (see **Error! Reference source not found.**). The lagoon forms a total of 50.24ha and there is approximately 850m-1,300m across. Therefore, there would be areas of the lagoon available to all species if they were to avoid humans. Nonetheless, in the absence of mitigation, the increase in visitors could result in a **Permanent Negative (Significant) Impact** at an **International Level**.' Therefore, the increase in visitors to Hodbarrow from 40,000 a year to 150,000 a year will increase recreational disturbance on the reserve, particularly visual disturbance to SPA species using the lagoon, the old sea wall and tern island. In the absence of mitigation, this is likely to have a significant effect on the non-breeding and breeding SPA bird species and assemblages using these areas. Therefore, recreational disturbance needs to be taken to the Appropriate Assessment stage of the HRA as required under the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations'), and mitigation secured to ensure a conclusion of no adverse effect on integrity of the SPA.	Y Y Y

Natterjack toads (Ramsar)	**Disturbance/harm of natterjack toads** e.g. by human use of site, management of habitats, etc.	The welcome building/car park site will remain largely unsuitable for natterjack toads post-development, although the presence of an occasional itinerant natterjack toad on site when dispersing/foraging cannot be ruled out. The EcIA states (6.7), 'The visitor centre and carpark will be closed to the public during times when natterjacks may be dispersing or foraging i.e. during the night, and therefore risk of injury or death of natterjacks as a result of cars in this area is considered unlikely. There may be occasions where private functions have hired out the venue during the evenings when natterjacks could be active, however given the unsuitability of the carparks and roads this is considered unlikely.' Regarding operational impacts on natterjack toads on the wider reserve, the EcIA states (6.7), 'the BOAT and paths will be re-surfaced and any potholes filled in leaving less opportunities for opportunistic natterjacks seeking refuge in pool formed in potholes which would reduce the chance of them being run-over by vehicles using the site. Additional habitat suitable for natterjack toads will be created and managed on site as part of the proposals, such as scrub clearance, pond creation/restoration, fencing of ponds to reduce disturbance and degradation by dogs. The aim of this is to encourage natterjack toads to access the site from adjacent land and to provide suitable breeding habitat for this species on site.' Additional information is included in the EcIA (9.4) regarding improving the reserve for natterjack toads, as follows; 'once the dense scrub has been cleared, proposals seek to create three additional ponds for natterjacks. Scrapes to be lined with concrete and backfilled with slag from the surrounding area. The ponds should have gently sloping sides to ensure safe passage out of the pools for toadlets and hold water down to a maximum water depth of 50 - 70cm that will dry out in late summer in an average year. The use	N N N

		simple pipe sluices could be installed so that the pools can be drained down in late summer. The two swales included in the surface water drainage strategy to attenuate flows located within dense scrub in the north of the reserve will also be designed to be suitable for use by breeding natterjack toads, such as having gently sloping sides and pipe sluices to drain them down in late summer (DSD1). Additional scrub clearance will be undertaken around the swales to create open habitats for natterjack toads, which will be maintained by the addition of conservation grazing. This will provide suitable habitat for this species in an area of the reserve that is currently unsuitable for them. It is recommended that a detailed Amphibian Management Plan can be incorporated into a LEMP. This Management Plan will also be iterative in the medium to long-term, adapting to changing site conditions and in response to the feedback from monitoring exercise. If required, these ponds could be used for a translocation of pillwort and natterjacks. In addition to the pools nearby resting/hibernation habitat will be created through the provision of sandy banks, stone walls, piles of stones. These areas will be fenced off to members of the public and dogs. There were several mitigation ponds created in 2017 however according to the Amphibian and Reptile Conservation officer these have rapidly become less suitable due to scrub encroachment and no ongoing management. Therefore, the recommended conservation grazing should help maintain the short sward height required for natterjack populations to use the site again. Proposals seek to fence of these existing mitigation ponds which will reduce disturbance from humans and dogs.' Therefore, considering the lack of existing breeding habitat for natterjack toads on site and	N

		the proposed enhancements as described above, it is highly unlikely that the Iron Line will have a significant effect on the integrity of the Ramsar site during operation through impacts on natterjack toads. *A long-term Landscape and Ecological Management Plan (LEMP) should be prepared and agreed in writing by the LPA, to include the management and monitoring of natterjack toad habitats created on site.*	N

CONCLUSION

Is the proposed development likely to have a significant effect alone on the Morecambe Bay and Duddon Estuary Special Protection Area (SPA) or Morecambe Bay Special Area of Conservation (SAC) and Ramsar?	Having assessed the available relevant information for the Iron Line project, it is considered that in the absence of mitigation, the proposed project is likely have a significant effect alone on the interest features of the Morecambe Bay and Duddon Estuary Special Protection Area (SPA), due to disturbance of breeding and non-breeding SPA species from construction activities and from recreational pressure on Hodbarrow Reserve (in critical areas). It is considered that the proposed Iron Line project on Hodbarrow Reserve is unlikely to have a significant effect alone on the interest features of the Morecambe Bay SAC (coastal fixed dunes) and Ramsar (natterjack toads).

Is the proposed development likely to have a significant effect in-combination with other plans and projects on the Morecambe Bay and Duddon Estuary Special Protection Area (SPA) or Morecambe Bay Special Area of Conservation (SAC) and Ramsar? Are there any hazards resulting from other plans or projects affecting the relevant area that should be taken into account - acting in combination with the hazards associated with the proposal under consideration?	Cumberland Council have identified other plans/projects that should be considered in the in-combination impact assessment, as follows (email from Christie Burns dated 12th April 2023): • 4/19/2153/0g1 – Port Haverigg Holiday Village, Haverigg – removal of Conditon 10 of planning permission 4/81/1132/086. • 4/19/2298/0e1 – Port Haverigg Holiday Village, Haverigg – lawful development as a caravan site, and land used in conjunction for roads, parking and manoeuvering. Open recreation areas, water sport including boat yard and quay, miniature railway and bbq and landscaping. • 4/22/2402/0b1 - Port Haverigg Holiday Village, Steel Green, Haverigg - amendments to layout and landscaping including relocation of ponds and enlargement of toilet block for planning approval reference 4/10/2387/0f1 - proposed extension of existing holiday village to provide 100 no. static caravan pitches, 20 no. motor home pitches, 30 no. touring caravan pitches, camping area for up to 20 no. tents, communal facilities building, 2 no. shower and toilet blocks, park maintenance compound, tourist information building incorporating cafe & public

	toilets, associated landscaping and infrastructure works. It was possible to view the documents submitted with the last planning application (4/22/2402/0b1) on the list above using the Cumberland Council online planning application search tool. A Preliminary Ecological Appraisal of the site was undertaken in August 2022, which identified two areas of ecological interest/concern; a breeding pool used by natterjack toads on site and the nearby protected statutory sites (SSSI, SAC and SPA), located within 100m of the proposed development. A number of mitigation and avoidance measures were recommended in the PEA to minimise risks to natterjack toads and to provide continued and enhanced habitat for the species on site, such as timing of works, pre-works checks, method statement for works, and monitoring by an ecologist. This proposed development at Port Haverigg Holiday Village has the potential to act in-combination with the proposed Iron Line project to impact the interest features of the SPA through increased recreational disturbance, as the development will provide additional accommodation for guests in the holiday village and therefore also potentially increase the number of people visiting Hodbarrow Reserve. It is unlikely that the proposed development at Port Haverigg Holiday Village would have a significant effect on SPA features through disturbance during construction, considering the distance of the proposed development site from the tern island (over 800m) and from the old sea wall (c.600m). Regarding the protected sites, the PEA recommends the provision of information for guests and tourists to encourage responsible behavior in and around the nearby protected coastal sites (especially of dog walkers). It is considered that as the proposed Iron Line project on Hodbarrow Reserve is likely to have a significant effect alone on the SPA, it may also have a significant effect on the SPA in-combination with the other plans/projects listed above.

Is an appropriate assessment required? **YES**/NO

NATURE CONSERVATION ASSESSMENT:

Duddon Estuary Site of Special Scientific Interest (SSSI)

The majority of the notified interest features of the Duddon Estuary SSSI are also qualifying features of the SPA/SAC/Ramsar designations, and therefore potential impacts of the proposals on the interest features have been included in the sALSE above as appropriate (e.g. breeding and wintering birds, fixed dunes and natterjack toads). Additional notified interest features of the Duddon Estuary SSSI are:

- Saltmarsh
- Other habitats (limestone flora)
- Invertebrate populations
- Incorporated Geological SSSIs

To enable compliance with the requirements of the Wildlife and Countryside Act 1981, as incorporated by the Countryside and Rights of Way Act 2000, assessment of any development likely to affect the site should also consider the additional interest features of the Duddon Estuary SSSI where relevant.

Summary of Assessment on Additional Notified Features of SSSI:

Below is a summary of assessment of potential impacts of the proposed Iron Line project at Hodbarrow Reserve, on the additional notified interest features of the Duddon Estuary SSSI. Reference has been made to the SSSI citation (Appendix 1) for the site when undertaking the assessment.

Saltmarsh

The SSSI citation states that extensive areas of saltmarsh occur around the outer edge of the estuary, and as a whole the SSSI supports the second largest area of saltmarsh in Cumbria after the Upper Solway and Morecambe Bay SSSI.

There is no saltmarsh habitat present within Hodbarrow Reserve/the proposed project area, and according to the online MAGIC map, the nearest saltmarsh habitat is located in the estuary approximately 1km to the north of the site. Therefore, the Iron Line project is not expected to impact SSSI saltmarsh habitats.

Other Habitats (Limestone Flora)

Under ‘other habitats’ in the SSSI citation, two limestone outcrops are described within the SSSI, including Hodbarrow Point, where grassland with a typical limestone flora can be found. Hodbarrow Point lies within Hodbarrow Reserve at the south-east point of the reserve. It is understood that the existing main desire line that runs across the grassland along Hodbarrow Point will be formalised, and signage and interpretation will be provided to encourage visitors to stick to the paths to avoid trampling vegetation. In addition, it is expected that the majority of visitors will follow the main route around the reserve along the BOAT, and the paths in the south-east of the reserve that lead to the windmill on the hill to the north of Hodbarrow Point, rather than the path along Hodbarrow Point; the windmill will be an attraction, hosting a camera obscura

and there will be several viewing points at the windmill providing elevated views across the bay (p79-81, DAS). The England Coast Path also follows the route on the reserve from the sea wall to the north of Hodbarrow Point, around the base of the windmill hill. Therefore, impacts on SSSI limestone habitats from the Iron Line are not expected.

Invertebrate Populations

According to the SSSI citation, the SSSI invertebrate populations are associated with the range of habitats found at North Walney and Sandscale. Therefore, as Hodbarrow Reserve in Millom is located at a considerable distance to the north of these areas, across the Duddon Estuary, impacts on SSSI invertebrate populations from the Iron Line are not expected.

Invertebrate survey work was undertaken within the zone of impact on Hodbarrow Reserve (20m buffer along BOAT/main path) and on the welcome building/car park site, in 2021 and 2022. Regarding the welcome building/car park site, the invertebrate survey report concluded (section 5.0 of report), 'on the available evidence and using the criteria in Plant (2009), the Redhills Quarry site ranks as of district importance based on the presence of two nationally scarce species. The results of a botanical survey (Styles, 2022) indicate that the site supports an internationally important calcareous grassland. After discussion with other ecologists this is not seen as relevant to the site being designated of international importance for invertebrates. None of the species taken, or likely to be found on this or any site containing calcareous grassland, includes invertebrates of international importance. A site of international importance would perhaps be one that had a population of an invertebrate known to be extremely rare throughout Europe.'

With regard to the main reserve, the conclusion of the invertebrate survey work undertaken in 2021 (section 4.8 of report) was that, 'overall, the surveyed habitats were concluded to be of likely District (low) importance for invertebrates. As per the brief, the survey was restricted to path-side habitats, and thus did not aim to provide a full species list for the reserve and all habitats. The true value of the reserve is more likely to be of county (moderate) importance. The inclusion of species such as the rove beetle (*Quedius invreae*), spring mining bee (*Colletes cunicularius*), broad groove-head spider (*Monocephalus castaneipes*) that are likely to be present within the site, would enhance the rating to county importance.'

Incorporated Geological SSSIs

According to the SSSI citation, the geological SSSI interest is associated with Walney Island, in particular North Walney. Therefore, as the proposed Iron Line site in Millom is located at a considerable distance to the north-east of this area, across the Duddon Estuary, impacts on the geomorphological interest of the SSSI from the Iron Line are not expected.

Therefore, it is not anticipated that the Iron Line project, as proposed, will impact on the additional interest features of the Duddon Estuary SSSI.

APPENDIX 1

Morecambe Bay SAC Conservation Objectives (Natural England, June 2014)

Morecambe Bay and Duddon Estuary SPA Conservation Objectives (Natural England, February 2019)

Duddon Estuary Site of Special Scientific Interest (SSSI) Citation (1990)

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-Ulicetea*); 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 (supporting explanatory text on following page)

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 Regulation 35 Conservation Advice Package, for further details please contact Natural England's enquiry service at enquiries@naturalengland.org.uk, or by phone on 0845 600 3078, or visit the Natural England website at: http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx

*** Priority natural habitats or species**

Some of the natural habitats and species listed in the Habitats Directive and for which SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Directive and the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the 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 Directive or the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. 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 as required by the provisions of Article 6(1) and 6(2) of the Directive.

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 Article 1 of the Habitats Directive.

Publication date: 30 June 2014 – version 2. This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014.

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.

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.

County: Cumbria **Site Name: Duddon Estuary**

District: South Lakeland, Copeland, Barrow-in-Furness

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

Local Planning Authority: South Lakeland District Council, Borough of Barrow-in-Furness, Copeland Borough Council, Lake District Special Planning Board

National Grid Reference: SD 190775 **Area:** 6,814.0 (ha) 16,837.0 (ac)

Ordnance Survey Sheet 1:50,000: 96 **1:10,000:** SD 18 NE, SE, SD 17 NW, NE, SE, SW, SD 16 NE, SD 28 NW, SW, SD 27 NW, SW

Date Notified (Under 1981 Act): – **Date of Last Revision:** 1990

Duddon Sands 1986
Hodbarrow Lagoon 1983
Sandscale Haws 1983
North Walney 1987
Haverigg Haws 1985

Other Information:

1. At this revision the boundary has been modified by the amalgamation of 5 previously separate SSSIs: Duddon Sands, Sandscale Haws, North Walney, Hodbarrow Lagoon and Haverigg Haws.
   Extensions and deletions have also been made.
2. The Duddon Estuary is considered to be equivalent in status to those sites listed in 'A Nature Conservation Review'. Within the estuary are 2 sites listed in 'A Nature Conservation Review', edited by D. A. Ratcliffe, 1977, published by Cambridge University Press. Duddon Sands, Walney and Sandscale Dunes.
3. In part the boundary is adjacent to the Duddon Mosses Site of Special Scientific Interest.
4. North Walney is a National Nature Reserve. Areas within the estuary are managed as nature reserves by the Royal Society for the Protection of Birds, the National Trust and the Cumbria Wildlife Trust.
5. The Natterjack Toad is a Schedule 5 species protected under the Wildlife and Countryside Act, 1981.
6. The Little Tern and Barn Owl are Schedule 1 species protected under the Wildlife and Countryside Act, 1981.
7. Part of the site lies within the Lake District National Park.
8. Duddon Estuary meets the criteria for designation as a Wetland of International Importance under the Ramsar Convention, and as a Special Protection Area under Article 4 of the E.C. Directive 79/409/EEC on the Conservation of Wild Birds.

Description and Reasons for Notification:

The Duddon Estuary is formed by the River Duddon and the smaller Kirkby Pool opening into the Irish Sea at the south-west corner of the Lake District. The mouth of the estuary forms an extensive flat sand plain, with the sands being very mobile. The mid and upper reaches of the estuary are flanked by saltmarsh and beyond high water are extensive sand dunes on both the north and south sides of the mouth of the estuary. These sand dune systems are particularly important for a diverse range of community types, supporting a number of rare and uncommon

plants, as well as a variety of nationally rare and scarce invertebrate species. The past activities of the mining and iron-making industries have created a number of artificial habitats which have become areas of wildlife interest. These include the slag banks of Askham Pier and Borwick Rails, and the largest coastal lagoon in north-west England at Hodbarrow Lagoon.

The Duddon Estuary is of international and national importance for wintering wildfowl and waders and provides a vital link in the chain of west coast estuaries used by migrating birds, as well as being of particular importance as one of a series of estuaries on the north-west coast where the majority of the British population of Natterjack Toads occur.

Wintering and breeding birds:
The Duddon Estuary regularly supports 21,880 wintering waders with internationally important numbers (exceeding 1% of the European population) of redshank (1,440), and knot (3,800). A further 5 species occur at nationally important levels (numbers exceeding 1% of the British population): oystercatcher (6,220), ringed plover (250), curlew (1,940), dunlin (5,460) and sanderling on passage (380). Passage counts indicate the international significance of the Estuary for sanderling with recent spring counts of over 1,500.

The Estuary also supports an average population of 5,000 wintering wildfowl with internationally important numbers of pintail (1,230) and nationally important numbers of shelduck (780) and red-breasted merganser (180).

Key areas for high tide roosts for waders and wildfowl include Haverigg Point, Hodbarrow Lagoon, Millom Marsh, Greety Gate Marsh, Kirkby Pool, Askham Pier, Sandscale Haws and North End Haws and Marsh. Key low tide feeding areas are not so well defined and vary depending upon the pattern of channels and wet sand.

The coastal habitats also provide nesting areas for oystercatchers, ringed plover, mallard, shelduck, coot, lapwing, lesser black-backed gull, redshank and snipe. Four species of tern (little, common, arctic and sandwich) nest at Hodbarrow Lagoon on bare slag, and a further successful breeding site for little tern is at Borwick Rails. Barn owls breed on the estuary and the area is used for feeding by peregrine and merlin.

The site is botanically rich and supports a diverse range of coastal habitats.

Saltmarsh:
Although much of the estuary is intertidal sand and silt, extensive areas of saltmarsh occur round the outer edge, and as a whole the site supports the second largest area of saltmarsh in Cumbria after the Upper Solway and Morecambe Bay SSSI.

Pioneer saltmarsh occurs at the seaward edge of the marsh where open stands of glasswort *Salicornia europaea* occur with occasional seablite *Suaeda maritima*, although in places, particularly on the eastern side of the estuary, invasive cord-grass *Spartina anglica* is becoming established. Above the pioneer zones lie extensive areas of low-mid marsh, which are heavily grazed with the short turf dominated by uncommon saltmarsh grass *Puccinellia maritima*. In places around the estuary, areas of ungrazed marsh occur and species less tolerant of grazing including sea purslane *Halimione portulacoides* can be found. As tidal inundation becomes less frequent the species composition within the mid-upper marsh changes from *Puccinellia* dominated communities to red fescue *Festuca rubra*. Characteristic species of the mid and upper marsh include sea milkwort *Glaux maritima*, sea arrowgrass *Triglochin maritima* and where ungrazed, sea aster *Aster tripolium* and two species of sea lavender, the common

Limonium vulgare and the uncommon lax-flowered *L. humile*. Sea rush *Juncus maritimus*, commonly occurs as a fringe on the landward edge of the saltmarsh.

In brackish water areas along rivers and inland of the saltmarshes, communities dominated by common reed *Phragmites australis*, or bulrush *Typha latifolia* are found. In some areas there is a freshwater influence for example at Sandscale Haws where there is a transition from brackish marsh to freshwater marsh rich in species such as yellow flag *Iris pseudacorus* and meadowsweet *Filipendula ulmaria*, and a transition from freshwater marsh to fen and willow carr.

Sand dunes:
Within the Duddon Estuary sand dune systems are well represented with important sites at Sandscale Haws, North Walney and the smaller site at Haverigg Haws. Sandscale Haws is the largest area of calcareous dune in Cumbria, and this together with the contrasting acidic dunes at North Walney makes the Estuary the most important site in Cumbria for sand-dune communities.

The zones around M.H.W. are largely shingle dominated, and at the north end of North Walney and at Haverigg Haws the strandline supports nationally rare shingle vegetation. Typical species include sea sandwort *Honkenya peploides*, spear-leaved orache *Atriplex prostrata*, sea rocket *Cakile maritima*, and two uncommon species Ray's knotgrass *Polygonum oxyspermum* ssp, *raii* and sea kale *Crambe maritima*. Rising up from the shingle beach are the mobile and yellow dune ridges. These are dominated by marram grass *Ammophila arenaria* together with sea holly *Eryngium maritimum*, sea spurge *Euphorbia paralias*, and sea bindweed *Calystegia soldanella*. As the vegetation cover increases further inland the dunes become less mobile and dune grassland is dominated by red fescue and sand sedge *Carex arenaria* and common bent *Agrostis capillaris*. Dune grasslands in all 3 sites support a rich flora with species such as wild pansy *Viola tricolor*, wild thyme *Thymus praecox* ssp. *arcticum*, lady's bedstraw *Galium verum*, common restharrow *Ononis repens*, the local dune fescue *Vulpia membranacea* and the nationally rare dune helleborine *Epipactis dunensis*.

Dune slacks, one of the most important communities within the dune system, occur in hollows between the dunes. Creeping willow *Salix repens* is often abundant, but in more open areas a rich diversity of uncommon plant species occur, including seaside centaury *Centaurium littorale*, round-leaved wintergreen *Pyrola rotundifolia*, marsh helleborine *Epipactis palustris*, variegated horsetail *Equisetum variegatum*, coral-root orchid *Corallorhiza trifida* and yellow bartsia *Parentucellia viscosa*.

On thinner drier soils at North Walney dune heath has developed. This is a rare habitat in Cumbria and confined to only two other areas in the county. The sward is dominated by ericaceous shrubs: heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, and bell heather *Erica cinerea*, with dyer's greenweed *Genista tinctoria* and a mosaic of mosses and lichens.

Other habitats:
Limestone outcrops at two points around the estuary, at Hodbarrow Point and Dunnerholme Point, where grassland with a typical limestone flora can be found. Also the slag bank and pier at Askham have been colonised by a wide range of species associated with a calcareous substrate or maritime situations. Two species of interest found in the vicinity are Isle-of-Man cabbage *Rhynchosinapis monensis* and dwarf spurge *Euphorbia exigua* at one of only two known Cumbria localities. High wood on the east side of the Duddon adds further diversity to the site and comprises a mixture of ash *Fraxinus excelsior*, oak *Quercus petraea*, hawthorn

Crataegus monogyna and willow *Salix* species. The ground flora is varied and includes *Carex strigosa* at the northern edge of its range.

Natterjack Toad:
The Natterjack Toad is a nationally rare species in Britain and over 95% of the population is associated with 5 estuaries, the Alt, Ribble, Duddon, Esk and Solway. The Duddon Estuary itself is therefore one of the most important areas in Britain for this species and contains between 18–25% of the U.K. population, which in turn is equivalent to 50% of the Cumbrian Natterjack Toad population. The toads breed in ephemeral pools associated with a range of habitats including dune slacks, marshy grassland, bare sand and slag banks, and hibernate and forage in the surrounding semi-natural vegetation, artificial habitats and semi-improved pastures. Particular concentrations occur at Millom Ironworks, Sandscale Haws and the stretch of coast between Sandside and Dunnerholme, but the species is evenly distributed over the whole estuary.

Invertebrates:
As a result of the range of habitats found at North Walney and Sandscale, these two sites are also important for their invertebrate populations, many typical of coastal habitats with a number of rare and nationally scarce species including the digger wasp *Psen littoralis*, the solitary bee *Colletes cunicularis*, water beetles associated with brackish waters *Octhebius marinus* and *O. auriculatus*, and moths including the Shore Wainscot *Mythimna litoralis* and the Portland moth *Ochropleura praecox*.

Geological:
North Walney is also of geomorphological interest. It represents the northern end of a barrier island of which there are few examples in Britain. Walney Island is exceptional in being the product of erosion and reworking of glacial sediments, rather than coastal deposition. The spits at Walney Island are important in several respects: 1. They represent the distal features of the offshore bar and occur in a macro-tidal location; 2. They differ in both form and sediments – North End Haws is fed by sandy sediments in the intertidal zone and has small dunes on its surface, whereas South End Haws comprises mainly shingle with limited dune development; 3. They are associated with "scars" (boulder and cobble-dominated areas of the intertidal zone) which are a characteristic form of this coast. The sites at Walney Island are important both in their own right and for comparative studies with other barrier island type features.