

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
5.5, Report to Inform Habitats Regulations Assessment
APFP Regulation 5(2)(g)
Planning Act 2008

Author: CH2M
Revision: Version 2
Date: September 2020

The original submission version of this document can be found in Appendix 9.12 of the Environmental Statement. The document contained within the Environmental Statement will not be updated. However, this standalone version of this document may be updated and the latest version will be the final document for the purposes of the Order.

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Document history

Project	Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme
Planning Inspectorate Scheme Reference	TR040011
Part and Application Document Reference	5, 5.5
Document title	Report to Inform Habitats Regulations Assessment
Regulation Number	APFP Regulation 5(2)(g)
Applicant	North Somerset District Council
Lead Author	EAA at CH2M

Version	Date	Status of Version
01	15/11/19	Application Issue
02	21/09/20	Update following ongoing consultation with Natural England and the Forestry Commission

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Executive Summary

0.1.1 This report forms one of a suite of documents that together support and explain in detail the content and nature of the Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme (hereafter called the “DCO Scheme”).

0.1.2 The DCO Scheme is promoted jointly by North Somerset District Council (“NSDC”) and the West of England Combined Authority (“WECA”) on behalf of the five West of England (“WoE”) authorities that also include Bath and North East Somerset (“B&NES”), Bristol City Council (“BCC”) and South Gloucestershire Councils (“SGC”).

0.1.3 The Conservation of Habitats and Species Regulations 2017 (as amended) ("the Habitats Regulations") give effect to Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna ("Habitats Directive") in England and Wales. The Habitats Regulations set out the staged process that must be followed where there may be a likely significant effect (“LSE”) on a European site of nature conservation importance (a Natura 2000 site). In all cases a developer must provide sufficient information to the competent authority (in this case the Secretary of State (“SoS”)) to enable the competent authority to undertake the assessments and evaluations required by the Habitats Regulations. The process of assessment is called a Habitats Regulations Assessment (“HRA”) and comprises between one and five stages depending on the findings at the end of the preceding stage. This document presents information required by the SoS in evaluating the DCO Scheme to:

- assess whether there would be a Likely Significant Effect (“LSE”) on any Natura 2000 site (Stage 1); and, if such an effect cannot be excluded,
- determine whether there would be an adverse effect on the integrity of any Natura 2000 site (Stage 2); and, if so,
- consider whether there are any alternative solutions to the DCO Scheme (Stage 3); and
- determine whether there are imperative reasons of overriding public interest (“IROPI”) why the DCO Scheme should proceed (Stage 4); and, if so,
- consider whether all necessary compensatory measures have been secured to ensure the overall coherence of the Natura 2000 network of sites (Stage 5).

0.1.4 As the DCO Scheme is not directly connected with or necessary to the management of a European site it is necessary to consider if it is likely to have a significant effect on any European sites, either individually or in combination with other plans or projects. Where such an effect cannot be excluded the DCO Scheme shall be subject to appropriate assessment of its implications for a European site in view of the site’s conservation objectives.

0.1.5 In the light of the conclusions of the assessment of the implications for a European site the SoS shall agree to the DCO Scheme only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public. If

the SoS concludes that the DCO Scheme must nevertheless be carried out for IROPI, he/she shall ensure that all compensatory measures necessary are taken to ensure that the overall coherence of Natura 2000 is protected and the UK must inform the European Commission of the compensatory measures adopted. If adverse effects on priority habitats or species cannot be excluded then the only IROPI considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

0.1.6 The DCO Scheme is an "EIA development" under the Infrastructure Planning (Environment Impact Assessment) Regulations 2017 and the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009. As part of the process of environmental impact assessment ("EIA"), NSDC requested a Scoping Opinion for the Environmental Statement ("ES"). Since the publication of the Scoping Opinion in August 2015 the description of the DCO Scheme has evolved as a result of changes to the project specifications and changes identified through iterative assessment. The changes in scheme design are described in Appendix 5.2 to the ES (DCO Document Reference 6.25). As a result, the nature and extent of engineering works proposed e have reduced. However, in the same period of time, there have been a number of decisions of the Court of Justice of the European Union ("CJEU") that have required changes to be made to the way in which mitigation measures can be taken into account within the process of appropriate assessment. The HRA has been revised to ensure that the information provided relates to the elements now proposed as part of the DCO Scheme and is sufficient to enable the SoS to determine the application in accordance with the Habitats Regulations and their interpretation by the CJEU.

0.1.7 Where LSEs on a European site cannot be excluded the process of assessment can comprise two or four stages. In the case of the DCO Scheme information to inform the HRA to be undertaken by the SoS comprises four stages, together with information on compensation measures. This report presents information on the following:

- Stage 1 – Screening
- Stage 2 – Appropriate Assessment
- Stage 3 – Assessment of Alternatives
- Stage 4 – Assessment of IROPI, and
- The securing of necessary compensation measures

0.1.8 Consideration has been given to the proximity of European sites to the DCO Scheme, the qualifying features of the European site, the Conservation Status of the qualifying interests, and the vulnerability of the European site and Conservation Objectives. This exercise identified the following sites for consideration in the Stage 1 screening assessment:

- Avon Gorge Woodlands Special Area of Conservation (“SAC”);
- Severn Estuary SAC, Special Protection Area (“SPA”), Ramsar site;
- North Somerset and Mendip Bats SAC;

- Chew Valley Lake SPA;
- Wye Valley Woodlands SAC;
- Wye Valley and the Forest of Dean Bat Sites SAC;
- Mendip Limestone Grasslands SAC;
- Bath and Bradford-on-Avon Bats SAC; and
- Mells Valley SAC.

0.1.9 As part of the process of EIA and HRA, consultation was undertaken with several consultees including BCC, Natural England ("NE"), NSDC and Avon Wildlife Trust ("AWT") and baseline ecological data were collected. Stage 1 excluded LSE of the DCO Scheme on the conservation objectives of seven of the European sites.

0.1.10 The following European sites, for which it is not possible to exclude LSE, either alone and/or in-combination with other project/plans, are:

- Avon Gorge Woodlands SAC; and
- North Somerset and Mendip Bats SAC.

0.1.11 In Stage 2 information is provided to enable the SoS to undertake an appropriate assessment of the effects of the DCO Scheme on the integrity of these two European sites, in which mitigation measures have been taken into account.

0.1.12 The LSE identified in respect of the North Somerset and Mendip Bats SAC is in relation to severance of foraging routes due to vegetation clearance and lighting. With the identified mitigation measures in place it is concluded that the DCO Scheme will not give rise to adverse effects on the integrity of the North Somerset and Mendip Bats SAC.

0.1.13 In respect of the Avon Gorge Woodlands SAC, the conclusion reached is that with identified mitigation in place, it is not possible to exclude the possibility of adverse effects on the site integrity owing to habitat loss of two qualifying features:

- semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (0.06 ha loss, which is approximately 0.84% of the qualifying grassland within the SAC).
- *Tilio-Acerion* forests of slopes, screes and ravines * Priority feature (up to 0.73 ha habitat loss, of which 0.40 ha is irreplaceable ancient semi-natural woodland). The loss of 0.73 ha is approximately 0.69% of the qualifying woodland within the SAC).

0.1.14 Further, it is not possible to exclude the possibility of an adverse effect on the integrity of the SAC owing to the predicted loss of up to 27 rare whitebeam trees, some of which are endemic to the Avon Gorge and are a component of the SAC woodland.

0.1.15 As it is not possible to determine that there will be no adverse effect on the integrity of the Avon Gorge Woodlands SAC, information is provided to enable the SoS to proceed to Stage 3 of the HRA process, in which an assessment of alternatives is undertaken, and then to Stage 4, in which consideration is given to IROPI for the DCO Scheme. As the status of the *Tilio-Acerion* forest in the Avon Gorge SAC is priority habitat, the IROPI

considered for that qualifying feature relate to human health, public safety and important environmental benefits. Socio-economic benefits are also considered as part of the IROPI in relation to the *Festuco-Brometalia* grassland only.

0.1.16 The package of compensation measures to be evaluated at Stage 5 of the HRA process is then considered. Measures are presented within the Avon Gorge Vegetation Management Plan ("AGVMP" Ver. 02, Appendix 9.11 of the ES, DCO Document Reference 8.12) and within this HRA report. As compensatory measures are proposed within the Avon Gorge Woodlands SAC the proposed compensatory measures must differ from the mandatory conservation measures that are required by Article 6(1) of the Habitats Directive. To ensure that the measures proposed as compensation for the DCO Scheme are optimised with the conservation measures proposed by Network Rail ("NR") as part of its own site management plan, it is proposed that for the DCO Scheme a range of measures to ensure that delivery of measures in agreement with NE will secure protection of the overall coherence of the Natura 2000 network. The compensation involves a programme of positive management in line with the conservation objectives for the SAC and includes removal of invasive species, management of mature trees to reduce competition and shading and scrub removal from grassland. A comprehensive programme for whitebeam conservation is described.

0.1.17 The compensation package also provides an option to undertake positive management on Forestry Commission ("FC") land adjacent to the Avon Gorge Woodlands SAC, as an alternative to some areas identified on NR land. The compensation proposals will be based on 1.6 ha of positive management in total, comprising 1.45 ha in woodland and 0.15 ha in grassland. This will allow an adaptive approach to compensation, enabling the DCO Scheme to deliver the optimum level of compensation for the SAC by improving an equivalent area of land on FC property as an alternative in whole or in part to compensation on NR land in some areas, if that is agreed to be preferable by NE.

0.1.18 It is concluded that positive management of both grassland and woodland habitats, as well as replacement planting of whitebeams in areas of lower-quality secondary (recent) woodland will contribute positively towards site conservation objectives and that avoidance and preventative mitigation, in conjunction with the proposed compensatory measures, will be effective in providing for the long term favourable conservation status of the Avon Gorge Woodlands SAC and the protection of the overall coherence of the Natura 2000 network.

SECTION 1

Introduction

1.1 Background to the DCO Scheme

1.1.1 This report forms one of a suite of documents that together support and explain in detail the content and nature of the Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme (hereafter called the "DCO Scheme").

1.1.2 The DCO Scheme is being jointly promoted by North Somerset District Council ("NSDC") and the West of England Combined Authority ("WECA") on behalf of the five West of England (WoE") authorities that also include Bath and North East Somerset ("B&NES"), Bristol City Council ("BCC") and South Gloucestershire Council ("SGC").

1.1.3 A summary of the DCO Scheme is provided in Section 3 of this report. Further detailed description is provided in the Environmental Statement ("ES") Volume 2, Chapter 4, Description of the Proposed Works (DCO Document Reference 6.7).

1.2 The Consenting Regime

1.2.1 The DCO Scheme comprises the Nationally Significant Infrastructure Project ("NSIP") and its Associated Development. The reconstruction of the disused section of the railway line between Portishead and Pill falls within the definition of a NSIP for the purposes of Section 25 of the Planning Act 2008, being the construction of a railway over 2 km in length. Other works required for the DCO Scheme, such as the new stations, works to the highway at Portishead and the alterations to the railway between Pill and Ashton Junction are Associated Development as defined by Section 115 of the Planning Act 2008. Within the Avon Gorge, works will take place within Network Rail's ("NR") operational land save for some geotechnical works on cliff faces that may require temporary access and works on third party land during construction.

1.2.2 The Project Promoter is NSDC and the Competent Authority is the Secretary of State ("SoS"). CH2M has been appointed by NSDC to identify and assess the environmental effects of the DCO Scheme and to prepare the information required to be submitted by the developer as part of the processes of the environmental impact assessment ("EIA") and Habitats Regulations Assessment ("HRA") for the DCO application.

1.2.3 This HRA Report has been prepared in accordance with the Planning Inspectorate's Advice Note 10 HRA (Version 8, Planning Inspectorate, 2017), along with the advice issued by the Planning Inspectorate in respect of procedures, the process of decision-making under the Planning Act 2008 and the Planning Inspectorate's Advice Note 05/2018 *Consideration of avoidance and reduction measures in Habitats Regulations Assessment: People over Wind, Peter Sweetman v Coillte Teoranta*. Regard has also been had to guidance published by Natural England ("NE"), including the Habitats Regulations Assessment (HRA) Standard (1 December 2017), to guidance issued by the European Commission including Commission notice *Managing Natura 2000 sites – The provisions of Article 6 of the 'Habitats'*

Directive 92/43/EEC (19 January 2019) and to the Department for Transport ("DfT") (2009) *Design Manual for Roads and Bridges* ("DMRB") Volume 11 Section 4 HD44/09 Assessment of Implications (of Highways and/or Road Projects) on European Sites (including Appropriate Assessment).

1.3 Requirement for Habitats Regulations Assessment

1.3.1 The Conservation of Habitats and Species Regulations 2017 (as amended) and preceding regulations (together "the Habitats Regulations") give effect to Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna ("Habitats Directive") and Council Directive 2009/147/EC on the conservation of wild birds in England and Wales ("Wild Birds Directive". Regulation 9(1) requires the SoS and NE to exercise functions which are relevant to nature conservation so as to secure compliance with the requirements of the Habitats Directive and the Wild Birds Directive. Under Regulation 9(2) these functions include those under the Planning Act 2008. Further, under Regulation 9(3), a competent authority, in exercising any of its functions, must have regard to the requirements of the Directives so far as they may be affected by the exercise of those functions. A competent authority includes any Minister of the Crown, government department, statutory undertaker, public body of any description (including a local authority) or person holding public office. Thus NSDC is a competent authority and required to have regard to the requirements of the Directives in exercising its functions. NR is a statutory undertaker and so subject to the same requirement.

1.3.2 Article 4 of the Habitats Directive requires the United Kingdom to contribute to the creation of the Natura 2000 network, a coherent European ecological network of special areas of conservation that shall enable the natural habitat types and species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range. Article 1 (e) defines "conservation status" of a natural habitat as "*the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species*" within the European Union ("EU"). Conservation status will be "*favourable*" when

"- its natural range and areas it covers within that range are stable or increasing, and

- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and

- the conservation status of its typical species is favourable…".

1.3.3 Habitats Directive Article 6(1) specifies that, for special areas of conservation, Member States "shall establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitats in Annex I and the species in Annex II present on the site". Article 6(2) requires Member States to take "*appropriate steps to avoid, in the special areas of*

conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive".

1.3.4 The Habitats Regulations transpose the relevant provisions of the Habitats Directive Article 6(1) and (2) in Part 2, which makes provision at regulation 20 for the use of voluntary management agreements between a nature conservation body and the owners and occupiers of land in or adjacent to a European site. Management agreements can restrict the use of land and impose management obligations. Such measures are 'necessary conservation measures' corresponding to the ecological requirements of the Special Area of Conservation ("SAC") habitats and species that are required to be established by the United Kingdom under Article 6(1). Activities that are potentially damaging operations are restricted by designation of all SACs in England as Sites of Special Scientific Interest ("SSSI") under the Wildlife and Countryside Act 1981, Section 28(1). Such measures are preventative measures and Regulations 23 to 26 of the Habitats Regulations give powers to NE in respect of SACs that are SSSIs to enable them to ensure compliance in particular with Article 6(2) of the Habitats Directive.

1.3.5 Habitats Directive Articles 6(3) and 6(4) are transposed by the Habitats Regulations in Part 4. Guidance on HRA relevant to nationally significant infrastructure is provided in the Planning Inspectorate's Advice Note 10 HRA (Version 8, Planning Inspectorate 2017) and the process is summarised in Figure 1 of that advice.

1.3.6 Sites protected under the Habitats Regulations include: SACs which host rare, endangered and vulnerable habitats and species of European importance; Special Protection Areas ("SPAs") which support significant populations of wild birds of European importance and their habitats and European Offshore Marine Sites ("EOMS"). Together SACs, SPAs and EOMS make up the Natura 2000 Network. In England, as a matter of policy, Ramsar Sites (identified under the Ramsar Convention), proposed SACs and potential SPAs are subject to the same procedures as SACs and SPAs. Together, these international sites are referred to as 'European sites'.

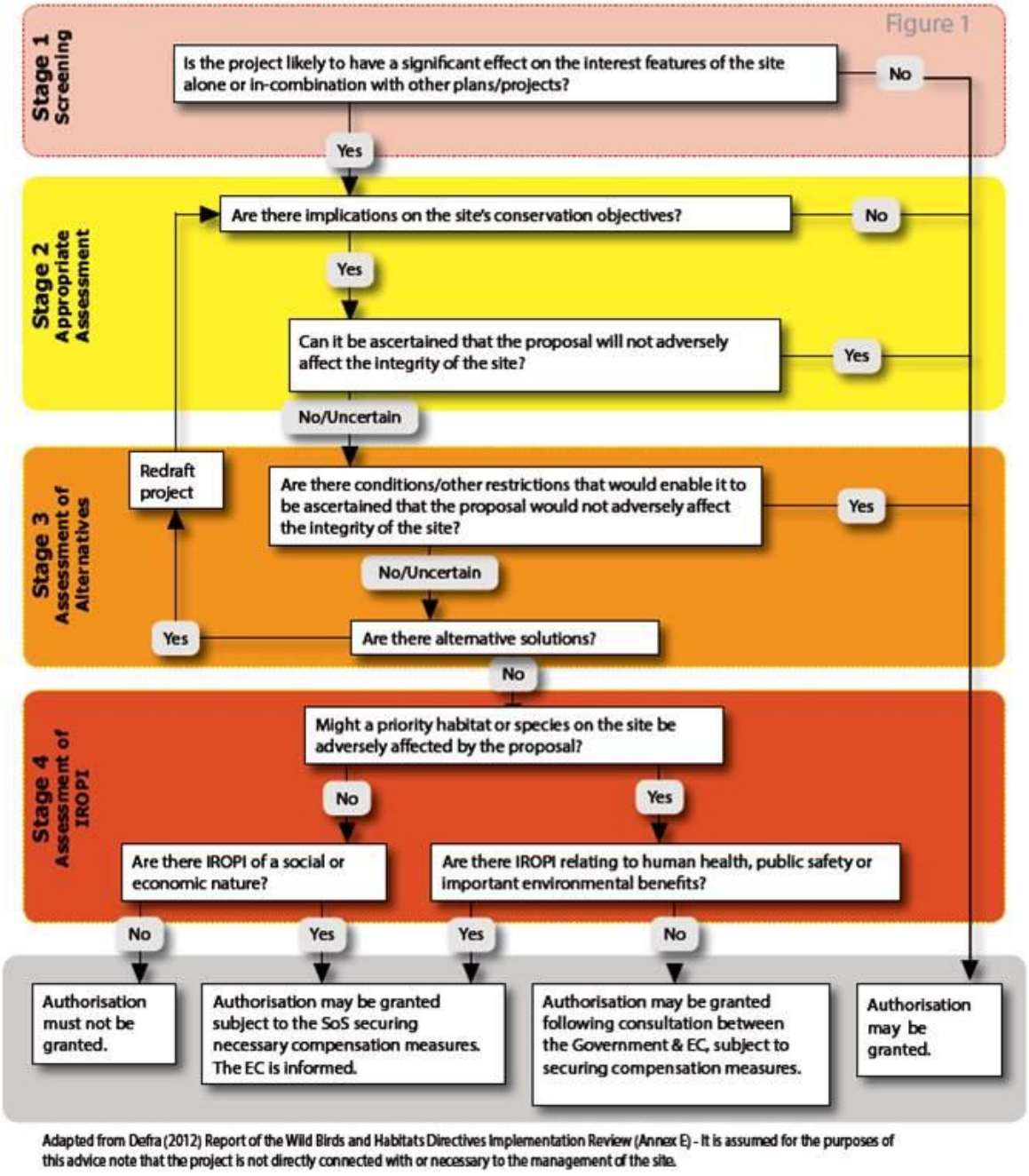


Figure 1.1. HRA Process Summary

1.3.7 Regulations 63 and 64 provide that no consent or permission shall be given for a project which is likely to have a significant effect on a European site (either alone or in combination with other plans or projects) unless the competent authority has undertaken an appropriate assessment of the implications of the project for the conservation objectives of the European site and ascertained that the project will not adversely affect the integrity of the European site. If the competent authority is satisfied that, there being no alternative solutions, the project must be carried out for IROPI, it may agree to the project notwithstanding a negative assessment of the implications for the European site. In such a case regulation 68 provides that the competent authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of the Natura 2000 network of

European sites is protected. Regulation 84 provides that "*the assessment provisions*" (defined in regulation 61(1) as comprising regulations 63 and 64) apply to the making of an order granting development consent under the Planning Act 2008 and that the SoS may make an order subject to requirements, if any adverse effects of the plan or project on the integrity of a European site would be avoided if the order granting development consent included such requirements under section 120 of the Planning Act 2008.

1.3.8 In addressing the application of Stages 1 and 2 of the HRA process to the DCO Scheme regard has been had to relevant judgments of the Court of Justice of the European Union ("CJEU") and to case law of English courts. Of particular relevance to the HRA process for the DCO Scheme are judgments in relation to:

- the degree of confidence in the prediction of effects;
- the meaning of "*adversely affect integrity*" in Regulation 63; and
- the HRA stage in which mitigation measures should be considered.

1.3.9 The first stage of assessment cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the plans or the projects proposed on the protected site concerned (*Grace and Sweetman, C-164/17, EU:C:2018:593)*.

1.3.10 The second stage of the assessment procedure, following the appropriate assessment of the implications of the plan or project for the site concerned, allows such a plan or project to be authorised only if it will not adversely affect the integrity of the site concerned (*Commission v Poland (Białowieża Forest), C-441/17, EU:C:2018:255)*.

1.3.11 It is only when it is sufficiently certain that a measure will make an effective contribution to avoiding harm to the integrity of the site concerned, by guaranteeing beyond all reasonable doubt that the plan or project at issue will not adversely affect the integrity of that site, that the measure may be taken into consideration in an appropriate assessment (*Commission v Germany, C-142/16, EU:C:2017:301* and *Grace and Sweetman, C-164/17, EU:C:2018:593*).

1.3.12 The "integrity" of a site, though not defined in the Habitats Regulations, is widely understood to mean the coherence of the ecological structure and function of a Natura 2000 site, across its whole area, that enables it to sustain the habitats, complex of habitats and/or the levels of populations of the species for which it was classified (DfT 2009, DMRB, Volume 11, Section 4 Part 1, paragraph 3.7). The meaning of "*adversely affect the integrity*" of a SAC was considered by the CJEU in *Peter Sweetman, Ireland and others v An Bord Pleanala [2013] EUECJ C-258/11* (11 April 2013), commonly called Sweetman I, and *TC Briels and others v Minister van Infrastructuur en Milieu (C 521/12) (2014) PTSR 1120* ("BRIELS"). In Sweetman I a proposed road scheme would have permanently destroyed 1.47 hectares of a 270 hectare Natura 2000 site of Community importance protected as a priority habitat for its limestone pavement. The CJEU determined that if a project will lead to the "*lasting and irreparable loss of the whole or part of a priority natural habitat type whose conservation was the objective that justified the designation of that site*" the competent national

authority must conclude that such a plan or project will adversely affect the integrity of the site. The CJEU also found that the precautionary principle should be applied in appraising a project to determine whether a plan or project not directly connected or necessary to the management of a site will adversely affect the integrity of a European site. Thus, where uncertainty remains the competent authority must refuse to authorise the plan or project unless the provisions of Article 6(4) are met.

1.3.13 In *Briels* the CJEU found that in order for the integrity of a site as a natural habitat not to be adversely affected the site needs to be preserved at favourable conservation status. The CJEU also found that protective measures provided for in a project that would end up compensating for the negative effects of a project on a Natura 2000 site cannot be taken into account in the assessment of the implications of the project provided for in Article 6(3). The CJEU noted that any positive effects of future creation of a new habitat aimed at compensating for the loss of area and quality of that same habitat type on a protected site, even where the new area will be bigger and of high quality, are highly difficult to forecast with any degree of certainty and will only be visible several years into the future. Consequently, the court found that these effects cannot be taken into account at the procedural stage provided for in Article 6(3) of the Habitats Directive. The CJEU was concerned to ensure that a competent authority could not permit so-called "mitigating" measures that are in reality compensatory measures in order to circumvent the specific procedures provided for in Article 6(3). Where compensation measures provide for the creation of an area of equal or greater size within the same natural habitat within the same site, such measures may be categorised as "compensatory measures" within the meaning of Article 6(4) only if the conditions laid down are satisfied: specifically, the compensatory measures undertaken shall be all those necessary to ensure that the overall coherence of Natura 2000 is protected.

1.3.14 In joined Cases *C-387/15 and C-388/15 Hilde Orleans and others v Vlaams Gewest* the CJEU considered whether the establishment of habitat areas prior to the occurrence of adverse effects on a natural habitat type within a European site should be treated as conservation measures or compensation measures where the completion of the replacement habitat would take place after the assessment of the effects of the proposed development on the integrity of the European site. The CJEU held that such measures were not conservation measures that could be taken into consideration in the Stage 2 Appropriate Assessment. Rather, such measures had to be categorised as "compensatory measures" within the meaning of Article 6(4), though only if the conditions laid down for such measures were satisfied.

1.3.15 At the outset of this DCO Scheme, English law on HRA was clear that mitigation measures that formed part of the proposed project should be taken into account in the determination of likely significant effects (“LSE”) (*R (Hart District Council) v Secretary of State for Communities & Local* Government [2008] EWHC 1204 (Admin) and *Smyth v Secretary of State for Communities and Local Government* [2015] EWCA Civ 174). Such mitigation measures included those commonly used in construction environmental management plans and in habitat management plans. If such mitigation measures could exclude the risk of harm then there was no need to proceed to Stage 2 and appropriate assessment. Clarification on

the difference between mitigation measures and compensatory measures was provided by the CJEU judgment in Case C-258/11 *Briels v Minister van Infrastructuuren Milien*, which distinguished between:

- protective measures aimed at reducing or avoiding any direct adverse effects for the site that can be taken into account in an assessment; and
- protective measures aimed at compensating for negative effects of a project on a Natura 2000 site that cannot be taken into account in the assessment of the implications of a project.

1.3.16 However, as a result of the judgements of the CJEU in Case C-323/17 *People Over Wind and Peter Sweetman v Coillte Teoranta* on 12 April 2018, Case C-164/17 *Edel Grace and Peter Sweetman v An Bord Pleanala* on 25 July 2018 and Case C-461/17 *Holohan v An Bord Pleanála,* on 7 November 2018 stricter interpretations of Articles 6(3) and (4) of the Habitats Directive are now required as described below.

- Measures intended to avoid or reduce harmful effects of the plan or project on any European site can no longer be taken into account in considering whether a project is likely to have a significant effect on the interest features of any European site, whether alone or in-combination with other plans or projects.
- Measures can be taken into account in the appropriate assessment only where there is sufficient certainty that they will make an effective contribution to avoiding harm, guaranteeing beyond all reasonable doubt that the project will not adversely affect the integrity of the site.
- An appropriate assessment must catalogue the entirety of habitat types and species for which a site is protected and identify and assess the implications of the project for non-listed species within the European site as well as habitats and species outside the European site where the implications are liable to affect the conservation objectives of the site.

1.3.17 In the light of Case C-323/17 the Planning Inspectorate issued Advice Note 5/2018 on 9 May 2018: *Consideration of avoidance and reduction measures in Habitats Regulations Assessment: People over Wind, Peter Sweetman v Coillte Teoranta*. Paragraph 5 states that competent authorities cannot take account of any integrated or additional avoidance or reduction measures when considering at the HRA screening stage whether the plan or project is likely to have an adverse effect on a European site. The Note recognises that "there is no authoritative definition of what constitutes an integrated or additional avoidance or reduction measure and this should be considered on a case by case basis. If a measure is being introduced to avoid or reduce an effect on a European site then it can be viewed as mitigation". Paragraph 17 advises that embedded mitigation can be viewed as mitigation, such as a commitment to employing standard methods to prevent run-off from vehicles contaminating watercourses.

1.3.18 Subsequently, in *R (Langton) v Secretary of State for Environment, Food & Rural Affairs & Another [2018] EWHC 2190 (Admin)* the implications of the ruling in Case C-164/17 were considered by the High Court in the context of whether NE had conducted adequate assessments under the Habitats

Regulations prior to granting licences for the culling of badgers. The Judge concluded that the licence conditions that NE attached to the cull licences were not mitigating or protective measures but properly characterised as integral measures of the project that could properly be taken into account in the "screening" process. The Judge accepted NE's submission that it would be contrary to common sense to have to assume that culling was going to take place at times and in places that the applicants did not propose to do so. In an appeal against the decision of the High Court, the Court of Appeal in *R (Langton) v Secretary of State for Environment, Food & Rural Affairs & Another [2019] EWCA Civ 1562* found that there was no need to determine the appeal on the ground that there had been a breach of the Habitats Regulations as it had been overtaken by events, specifically the undertaking of new assessments to accord with the judgement of the CJEU in People over Wind, and there was no evidence of a large number of similar cases before the court, there were no exceptional circumstances to warrant determination of the ground of appeal.

1.3.19 Subsequent CJEU judgements on 7 November 2018 in Case C-293/17 and Case C-294/17 Coöperatie Mobilisation for the Environment UA and Vereniging Leefmilieu v College van gedeputeerde staten van Limburg and College van gedeputeerde staten van Gelderland (called the "Dutch Nitrogen" cases) have been taken into account. The CJEU found that the future benefits of protective measures cannot be taken into account at Stage 2 of HRA (appropriate assessment) if those benefits are uncertain, in part because the procedures needed to accomplish them have not yet been carried out or because the level of scientific knowledge does not allow them to be identified or quantified with certainty. The CJEU ruled that an appropriate assessment may not take into account the existence of conservation measures or preventative measures specifically adopted if the expected benefits of the measures are not certain at the time of the assessment.

1.3.20 The consequence of the Dutch Nitrogen cases is that where the effectiveness of measures to prevent adverse impacts on a SAC will not be sufficiently certain of preventing an adverse effect on integrity at the time of the assessment then they cannot be taken into account in the Stage 2 Appropriate Assessment. These measures can include those known as 'adaptive mitigation', in which measures for habitat management will take some time to become effective. Such measures will now be treated as compensatory measures whose contribution to a European site can be considered only after a determination has been made as to whether a project satisfies the IROPI test.

1.3.21 The Dutch Nitrogen cases also confirmed that an 'appropriate assessment' may not take into account the existence of 'conservation measures' within the meaning of Article 6(1) if the expected benefits of those measures are not certain at the time of that assessment. NR is proposing conservation measures to be delivered in accordance with a Site Management Statement (“SMS”). The purpose of the conservation measures is to maintain or restore, at favourable conservation status, the natural habitats and species of wild fauna and flora of Community interest for the SAC, taking into account economic, social and cultural requirements and regional and local characteristics. Guidance on the positive obligation placed on the UK to

draw up conservation measures and adopt appropriate statutory, administrative or contractual measures in respect of all SACs is set out in Article 6(1). Guidance is provided by the European Commission (2019) publication "Managing Natura 2000 sites – the Provisions of Article 6 of the "Habitats" Directive 90/43/EEC". The NR conservation measures do not form part of the application for the DCO Scheme and as there was insufficient detail about them available at the time of preparation of this HRA their benefits have not been assumed. The relationship between those conservation measures and the compensatory measures proposed as part of the DCO Scheme has been considered and described.

1.3.22 As a result of the CJEU interpretations of Article 6(3) and (4) of the Habitats Directive a distinction is now drawn between the following:

- Conservation measures for special areas of conservation that correspond to the ecological requirements of the natural habitats and species and maintain or restore natural habitats at a favourable conservation status. These should be distinguished from measures proposed as part of the DCO Scheme. The conservation measures do not form part of the DCO Scheme and will be provided irrespective of the DCO Scheme.
- Measures that are integral parts of the DCO Scheme that are not intended to avoid or reduce direct adverse effects. Provided these are not avoidance or mitigation measures they may be taken into account in Stage 1 (screening).
- Protective measures forming part of the DCO Scheme that are intended to avoid or reduce any direct adverse effects to ensure that the DCO Scheme does not adversely affect the integrity of a European site (Habitats Directive Article 6(3); Habitats Regulations Regulation 63), which can be taken into account in Stage 2 (appropriate assessment) provided the expected benefits are sufficiently certain at the time of assessment.
- Measures that are aimed at compensating for the negative effects of the DCO Scheme on a European site and that cannot be taken into account in the assessment of the implications of the project (Habitats Directive Article 6(4); Habitats Regulations Regulation 64) but are relevant to the evaluation at Stage 5.

1.3.23 If the UK has left the EU before the determination of the application for the DCO Scheme then the Conservation of Habitats (Amendment) (EUExit) Regulations 2019 (as amended) will, from exit day, amend Regulation 64 to require the SoS for Business, Energy and Industrial Strategy in giving an opinion as to whether the reasons are IROPI to have regard to the national interest following consultation with and having regard to the opinion of the Joint Nature Conservation Council ("JNCC"), the devolved administrations and any other person the SoS considers appropriate. In an application for permission for judicial review of certain provisions in the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 on the grounds that they have gone beyond the power granted under section 8 of the European Union (Withdrawal) Act 2018 to remedy deficiencies in retained EU law, the judge denied permission, noting that additional wording does not substantially change the law but had it done so then the

amendment would go beyond the 'Henry VIII' powers available under the European Union (Withdrawal) Act 2018. In the permission hearing the Judge heard from Government lawyers that the Habitats Directive would continue to be interpreted in the same way after Brexit as now.

1.3.24 The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018 (SI 2018/1307) were issued in December 2018. Regulation 2 amends the Habitats Regulations 2017 to reflect the ruling in Case 323/17. Amendments were made to the National Planning Policy Framework ("NPPF") on 19 February 2019 to reflect the ruling in Case 323/17. Neither the amendments to the Habitats Regulations or the NPPF are relevant for the DCO Scheme.

SECTION 2

Methodology

2.1 Assessment Methodology

2.1.1 The information provided for the SoS to carry out the HRA for the DCO Scheme has been undertaken in accordance with the Planning Inspectorate Advice Note 10 HRA (Version 8, the Planning Inspectorate 2017).

2.1.2 This guidance outlines the following stages of the assessment process.

- HRA Stage 1 (Screening) – The scope of the HRA should be defined and justified. The HRA should include screening for LSE alone or in combination with other plans or projects. If there are no LSE for any European sites under consideration, then the report is likely to be presented as a 'No Significant Effects Report' ("NSER") and Stages 2 to 4 will not be required.
- HRA Stage 2 (Appropriate Assessment) – If Stage 1 identifies LSE for any of the European sites under consideration, an assessment of the implications of the project on the Conservation Objectives of the site(s) will be required. This will take the form of a HRA report and should include sufficient information for the SoS to undertake the Appropriate Assessment.
- HRA Stages 3 and 4 (Assessment of Alternatives, Compensatory Measures and IROPI) – If Stage 2 concludes that the project will adversely affect the integrity of the site(s), or is inconclusive, then consideration of alternatives, compensatory measures and whether the project is justified by IROPI will be required, also as part of the HRA process.

2.1.3 This report has drawn on information collated and assessed during the preparation of the ES for the project (to which this report is an appendix), including information on other plans and projects (for assessment of possible in-combination effects) and the outcomes of ongoing engagement as part of the environmental assessment process, with Natural England and other organisations such as NSDC as the local planning authority, BCC, the Environment Agency and Avon Wildlife Trust ("AWT").

2.1.4 The approach to considering mitigation measures at Stage 1 Screening has been undertaken in accordance with the approach set out at paragraph 1.3.17, in particular distinguishing between measures that are integral to the DCO Scheme, protective measures forming part of the DCO Scheme and measures intended to compensate for negative effects of the DCO Scheme. Following the judgment in Case C-323/17 all protective measures were removed from the Stage 1 assessment of the DCO Scheme. Following the judgment in Case C-164/17 protective measures taken into account in Stage 2 were evaluated to determine whether they were sufficiently certain to make an effective contribution to avoiding harm. The scope of the HRA Report has been reviewed

following Case C-461/17 to ensure that non-listed habitats and species that have implications for the European sites had been included in the assessment

2.2 Information Sources

2.2.1 Information was taken from the following sources for the assessment:

- Portishead Branch Line (MetroWest Phase 1) Scoping Report
- Portishead Branch Line (MetroWest Phase 1) Environmental Statement – to which this report is appended
- Portishead Branch Line (MetroWest Phase 1) Avon Gorge Vegetation Management Plan ("AGVMP") (Ver. 02, ES Appendix 9.11, DCO Document Reference 8.12)
- Bristol Regional Environmental Records Centre ("BRERC") records
- Multi-Agency Geographic Information for the Countryside ("MAGIC") http://magic.gov.uk/
- JNCC website http://jncc.defra.gov.uk/ProtectedSites
- Natural England Access to Evidence website http://publications.naturalengland.org.uk
- Natural England Designated Sites View website https://designatedsites.naturalengland.org.uk/

2.3 Baseline Information

2.3.1 A summary of the ecological studies and surveys carried out for the DCO Scheme and relevant to this assessment is given in Annex C. These include desk-based searches for information on statutory designated sites and protected species records (including records for the Habitats Directive Annex II bat species) and field-based surveys for habitats, bats and birds between 2014 and 2019.

2.3.2 International designated sites were identified within a 10 km radius of the DCO Scheme and this search radius was extended to 30 km for sites with Annex II bat species as qualifying features.

2.4 Structure of this Report

2.4.1 This report updates and supersedes all previous HRA reports for the DCO Scheme.

2.4.2 In accordance with the Planning Inspectorate Advice Note 10 HRA (Version 8, the Planning Inspectorate 2017) the following information is presented for Stage 1 Screening:

- a description of the development (Section 3);
- evidence of consultation on the scope, methodologies and interpretation of the screening assessment between the Applicant and all relevant Statutory Nature Conservation Bodies ("SNCB") (Section 4); details of the methodology used to determine which European sites should be included within the assessment (Section 5);

- plans and description of the European site(s) potentially affected (Annex A Figures and Table 5.1);
- an outline and interpretation of the baseline data collected to inform the findings (Section 6 and Annex C);
- appraisal of the potential effects resulting from the construction and operation of the project alone (Section 7, Table 7.1);
- appraisal of the effects of any other plans or projects which in-combination with the DCO Scheme, might be likely to have a significant effect on the European site(s) (Section 7, Table 7.2); and
- screening matrices that summarise the screening exercise for LSE (Annex D).

2.4.3 Where LSEs on a European site(s), either from the project alone or in combination with other plans or projects, cannot be discounted, the assessment considers whether such effects will adversely affect the integrity of the site in view of its conservation objectives.

2.4.4 In respect of Stage 2, Appropriate Assessment, the following information is presented:

- information identifying the qualifying features, Conservation Objectives and conservation status of each of the qualifying features that might be affected (Section 8.2);
- evidence about the project's effects on the integrity of protected sites (Section 8.3);
  - a description of any mitigation measures proposed (including timing and mechanisms proposed to secure these mitigation measures) which avoid or reduce each effect, and any remaining residual effects (Section 8.4);
  - a statement as to which (if any) residual effects constitute an adverse effect on the integrity of a European site(s) either alone or in combination with other plans or projects (Section 8.5);
  - evidence to demonstrate that the Applicant has fully consulted and had regard to comments received by the relevant SNCBs during pre-application consultation (Section 4); and
  - integrity matrices for all the European sites taken to HRA Stage 2: Appropriate Assessment, to summarise this part of the assessment (Annex E).

2.4.5 Where it is not possible to conclude beyond all reasonable scientific doubt that there is no possibility of an adverse effect on the integrity of a European site, it is necessary to proceed to Stage 3, the assessment of alternatives. The Planning Inspectorate Advice Note 10 HRA (Version 8, the Planning Inspectorate 2017) advises that the Applicant's HRA Report should identify and assess alternatives that have been considered, which could include a project of a different scale, a

different location, and the 'do nothing' approach. For the DCO Scheme alternatives have been identified and assessed in Section 9.

2.4.6 If there are no alternative solutions to the project that would have a lesser effect or avoid an adverse effect on the integrity of a European site, the project may still be carried out if the SoS is satisfied that the DCO Scheme must be carried out for IROPI. The Planning Inspectorate Advice Note 10 HRA (Version 8, the Planning Inspectorate 2017) states that the IROPI justification should be provided in the HRA Report. Generally, the IROPI justification will take into account reasons of a social and/or economic nature. However, in the case of priority natural habitat or species affected by the development, the IROPI justification must relate to either:

- human health, public safety or beneficial consequences of primary importance to the environment; or
- having due regard to any opinion of the European Commission.

2.4.7 The Planning Inspectorate Advice Note 10 HRA (Version 8, the Planning Inspectorate 2017) states that where an applicant determines a negative impact at Stage 2: Appropriate Assessment, an assessment of compensatory measures must also be included in the HRA Report that forms part of the DCO application documents. Details of compensatory measures are provided in Section 11 of this HRA Report.

SECTION 3

Description of the Proposed Project

3.1 Background to the DCO Scheme

3.1.1 The Portishead Branch Line was built in the 1860s. Passenger services continued between Portishead and Bristol until 1964, and freight services continued to 1981. The Royal Portbury Dock opened in 1978 and in 2001 the currently operational part of the former Portishead Branch Line was re-opened to service the port for freight only. The owner of the Royal Portbury Dock, Bristol Port Company, has commercial rights to run up to 20 freight trains per day in each direction along the operational railway line. The current volume of freight trains operating is substantially less than this.

3.1.2 In order to reintroduce passenger services, the disused railway between Portishead and Pill has to be rebuilt. These works qualify as a NSIP as defined by the Planning Act 2008. In addition, associated development is required, including new station and car parks at Portishead and Pill, and various works along the operational railway between Pill and Ashton Vale.

3.1.3 A DCO covering the NSIP and the associated development is required for powers to build and operate the railway, as well as to acquire land, where it cannot be acquired by negotiation.

3.1.4 This section summarises the main features of the DCO Scheme. Further details are provided in the ES Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7).

3.2 The DCO Scheme

3.2.1 Figure 3.1 below shows the location of the DCO Scheme. A more detailed version of the scheme elements and indicative Order limits at 1:2,500 (A3) is provided in Part 2 of the DCO Application in the General Arrangement Plans (DCO Document Reference 2.4).

The NSIP between Portishead and Pill

3.2.2 The NSIP comprises a new permanent railway approximately 5,558 metres from the new station at Portishead to a new railway junction (Pill Junction) in the village of Pill located between Pill Viaduct and Pill Tunnel and the slight slewing of a section of the existing operational railway to Royal Portbury Dock between a location about 262 m north west of the Avon Road Bridge over the railway and Pill Junction. This slight realignment of the existing railway (freight) will provide space for both the new railway (NSIP) and the existing railway (freight) to run in parallel through Pill, and then merge together at Pill Junction.

3.2.3 Key elements are, in summary:

- Removal of existing rails, sleepers and ballast;
- Placement of new ballast, sleepers and rails; and
- A new railway switch and associated points motor at Pill Junction.

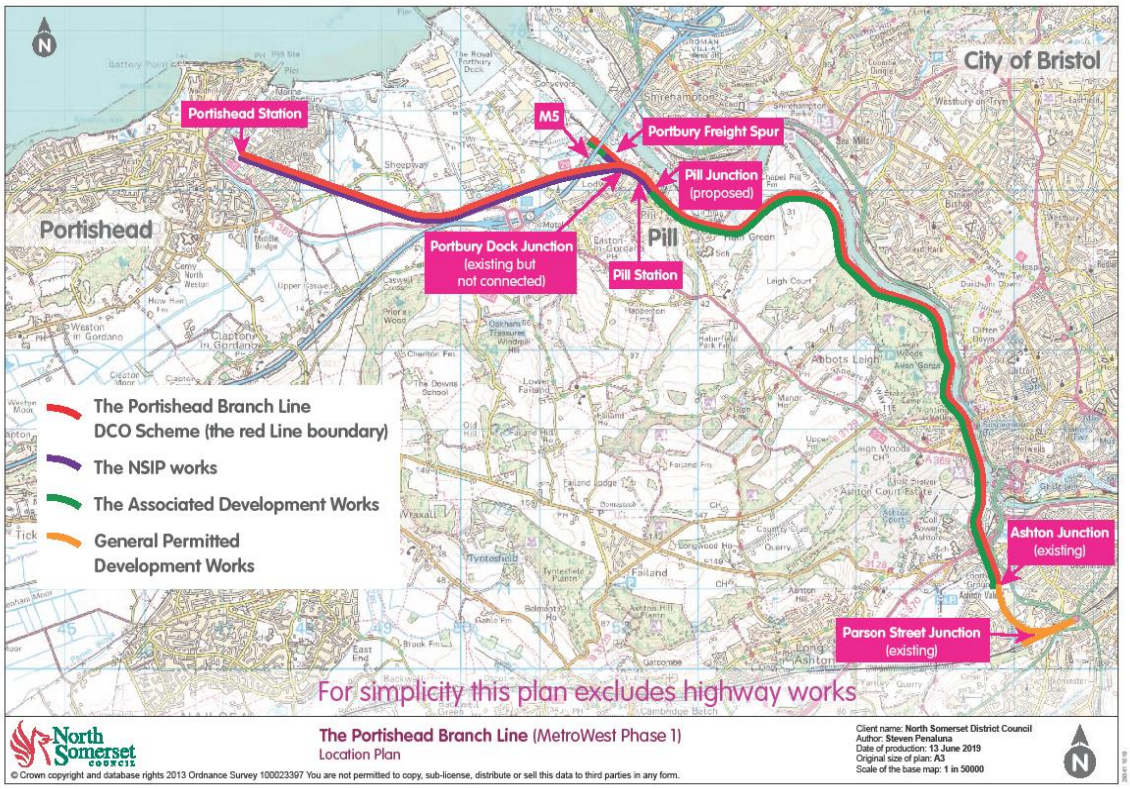


Figure 3.1. Location of the Portishead Branch Line DCO Scheme

Associated Development

Portishead railway station and surrounds

3.2.4 Quays Avenue will be re-aligned to the west of its current position, to provide sufficient space to build a new station and avoid the need for a level crossing on Quays Avenue.

3.2.5 The new Portishead railway station will be constructed on the north side of the new railway between the re-aligned Quays Avenue and the existing Wessex Water pumping station. Two new car parks will be built, one to the north of the station and one to the west adjoining a new boulevard along the alignment of the railway corridor.

3.2.6 The station will comprise a single platform, station building and canopy structure sheltering a section of the platform. The platform will be approximately 130 m long and lit by luminaires on lighting columns at 15 m spacing. An acoustic barrier will be erected on the south side of the railway.

3.2.7 Drainage from the modified highway and car parks will be discharged via pollution control units to Portbury Ditch or The Cut. Rainwater from the station roof and platform will be discharged to The Cut.

3.2.8 A new combined pedestrian and cycle bridge and associated paths are proposed to link residential areas in Portishead between the south and north sides of the railway in the vicinity of Trinity Primary School.

3.2.9 Temporary construction compounds are proposed at the sites of the two new car parks to construct the station and railway and on land

between Tansy Lane and the railway to construct Trinity Primary School Bridge.

Works in the Vicinity of Sheepway

3.2.10 A new permanent maintenance compound (and temporary construction compound) and track access point will be provided on the north side of the railway and west of Sheepway. The cycle route will be diverted during construction to a new alignment. A new pond will be created in the Portbury Wharf Ecology Park for great crested newts.

3.2.11 During construction haul roads will be laid down either side of Sheepway, taking account of the requirements of the National Grid Hinkley C Connection project which is under construction.

3.2.12 A permanent improved access will be provided off Sheepway to fields on the south side of the railway to replace two accommodation crossings for Shipway Gate Farm.

Works in the Vicinity of the A369 Portbury Hundred and Old Portbury Station

3.2.13 A temporary construction compound will be provided between the A369 Portbury Hundred and the railway and an improved access off the A369 will be built to be used by construction traffic and subsequently by the landowner to replace an accommodation crossing over the railway. A temporary haul road will run along the southern side of the railway connecting with the haul roads at Sheepway. The design includes a permanent new pond on the north side of the railway, as part of the mitigation for great crested newts, if it is determined that a European protected species ("EPS") licence is required. If District Level Licensing ("DLL") is adopted, then the pond is not required. Licensing and consents are explained in Section 9.5 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12).

3.2.14 The drainage ditches along each side of the disused railway corridor will be cleared of vegetation and reformed. The culverts under the disused railway will be either restored or replaced on a like-for-like basis. It is not envisaged that it will be necessary to enlarge the existing culverts under the railway.

Station Road Portbury to Marsh Lane Easton-in-Gordano

3.2.15 The existing bridleway along the north side of the disused railway will be subject to minor alterations. The vehicle access and parking off the A369 Portbury Hundred to the Wessex Water pumping station will be enhanced for construction and permanent maintenance of the railway.

Works between Marsh Lane, Easton-in-Gordano and the M5

3.2.16 The existing bridleway and perimeter road between Marsh Lane and the M5, which is used by the Bristol Port Company, will be used as a haul road providing access off Marsh Lane to a temporary construction compound under the M5 Avonmouth Viaduct and another construction compound at Lodway Farm. Minor works to the bridleway and cyclepath are proposed. The Openreach fibre cable route along the railway will be relocated in the cess alongside the new railway. The

Cattle Creep Bridge will be strengthened as part of the NSIP. A new pond near the bridge will be created for great crested newts (if an EPS licence is used rather than DLL) and land near the Easton-in-Gordano stream will be lowered slightly to provide flood compensation for the widened railway embankment.

Works between the M5 and Pill Station

3.2.17 A temporary construction compound will be provided at Lodway Farm. The site will be mainly used to stockpile ballast. The main access will be from Marsh Lane and under the M5 Bridge. There will also be a haul road through six residential gardens off Lodway Close to access the Avon Road Embankment and Bridge works.

3.2.18 The single deck bridge carrying the railway over footpath LA8/5/40, between Lodway Close and Avon Road, Pill will be replaced with a new double track structure, to allow both the new railway and the Portishead Line to run in parallel between Portbury Dock Junction and Pill.

3.2.19 To improve working space during the reconstruction of the Avon Road Bridge, National Cycle Network ("NCN") route 41 would be diverted temporarily around a field known as Jenny's Meadow. A group of twelve garages will be demolished to create space for a crane pad and construction compound on Avon Road and part of a garden wall on Marine Parade will be demolished and rebuilt to facilitate the movement of the crane through Pill.

3.2.20 A bridleway extension is proposed under the M5 Avonmouth Viaduct to meet the permissive cycle path west of Avon Road in Pill, which will improve the route for equestrians.

3.2.21 New railway signalling equipment is required along the spur of the operational railway into the Port.

Pill Station and Car Park and Pill Viaduct

3.2.22 A new railway station will be constructed on the site of the old station at Pill. The property at No. 7 Station Road will be demolished to create the new station forecourt comprising a drop off area, mobility impaired parking spaces and cycle stands. Hardwick Cutting along the southern side of the railway will be cut back, steepened and strengthened to provide sufficient space for the new railway and existing operational railway. A new ramp and staircase will connect the station entrance to the southern platform which will be rebuilt. A small shelter will be built on the platform in front of the pedestrian ramp. An emergency refuge area will be created at the western end of the platform. New lighting will be provided along the platform comprising columns about 5 m high and the emergency refuge area will be lit by lighting bollards, all at about 11 m spacing. A new signal will be provided on the northern platform and the coping on the edge of the platform will be cut back to accommodate the passage of freight trains on the slightly realigned railway.

3.2.23 A new station car park and permanent maintenance compound with road rail access will be provided at the site of the former railway yards

off Monmouth Road. As Pill Station will not be accessible by buses, the bus stop on Heywood Road will be improved.

3.2.24 Minor works are required to the abutments and structure of Pill Viaduct to repair the existing structure include installing pattress plates, infilling the vaulted cavity above the piers and vegetation clearance including tree and shrubs. Works to the top of the viaduct include replacement of the ballast and laying a second railway as part of the NSIP. A small temporary compound is proposed under the viaduct between Star Lane and Pill Library.

3.2.25 The embankment slopes on the east side of Pill Viaduct and at the rear of Mount Pleasant and Eirene Terrace, Pill will be widened, steepened and strengthened to accommodate the two railway lines coming off the viaduct before they merge at Pill Junction to a single line.

East of Pill Junction to the Clifton Suspension Bridge

3.2.26 The two main works along this section of the railway are the temporary construction compound and permanent maintenance compound at Ham Green and the partial dismantling and rebuilding of Quarry Bridge No. 2.

3.2.27 A new permanent compound is proposed for maintenance and emergency purposes at the eastern portal of Ham Green. It will consist of hardstanding for vehicle parking and turning, with fencing and landscaping. The new construction and maintenance access will run parallel to Hayes Mayes Lane on the western field boundary to the tunnel entrance and along the railway boundary towards Ham Green Lake to minimise land-take. The hard standing for parked vehicles and turning area will be provided to the bottom of the slope adjoining the railway. Localised land contouring will be required to provide sufficient flat land to accommodate the turning circle. Tree and shrub screening will be provided along the northern boundary of the compound. A new access to Ham Green Lake will also be formed.

3.2.28 Quarry Bridge No. 2 (Abbots Leigh) on the operational railway north of Clifton Bridge No. 2 Tunnel is a masonry, single span arch bridge. The bridge requires strengthening to accommodate the new passenger service. The bridge will be partially dismantled and rebuilt. To enable construction works, a temporary ramp and construction compound will be constructed along the west side of the railway, requiring vegetation clearance.

3.2.29 Minor works along this section are also required to improve existing track geometry, tunnels, bridges, retaining walls, geotechnical works on cliff faces in the Avon Gorge, and provide permanent pedestrian maintenance access.

3.2.30 Access along this section of the DCO Scheme is difficult as it includes much of the Avon Gorge. Key access and welfare locations may include Lodway Farm, the compound under the M5 Avonmouth Viaduct, Pill station car park, Ham Green compound to the north and Clanage Road to the south of the Avon Gorge.

Works to improve existing track geometry

3.2.31 The line speed on the existing operational railway between Pill and Ashton Junction will remain unchanged at 30 mph. However in order to achieve an acceptable ride comfort for passengers, some minor adjustments to the track geometry will be needed. This will include some track slewing up to a few centimetres and recanting to improve the alignment of the track to achieve the required ride comfort. All track realignment work will be within NR's existing railway boundary.

3.2.32 The track between Pill Junction and Ashton Junction will be renewed including track lifting, re-railing, re-ballasting, sleeper replacement and tamping.

Minor Works to Tunnels

3.2.33 The line between Ashton Junction and Pill Junction passes through four tunnels (see Figure 3.2 below for locations). Three of them, Clifton Bridge No. Tunnel, Clifton Bridge No. 2 Tunnel and Sandstone Tunnel lie in the Avon Gorge Woodlands SAC. Pill Tunnel lies between the settlements of Pill and Ham Green.

3.2.34 There are no plans for major works to the four tunnels along the DCO Scheme and the railway will remain single track through each one. Emergency lighting with containment to run on hangers are required through Pill Tunnel. Some vegetation clearance works may be required above the tunnel portals and localised repairs and strengthening may also be required to the tunnel linings. The extent of works will be confirmed at detailed design.

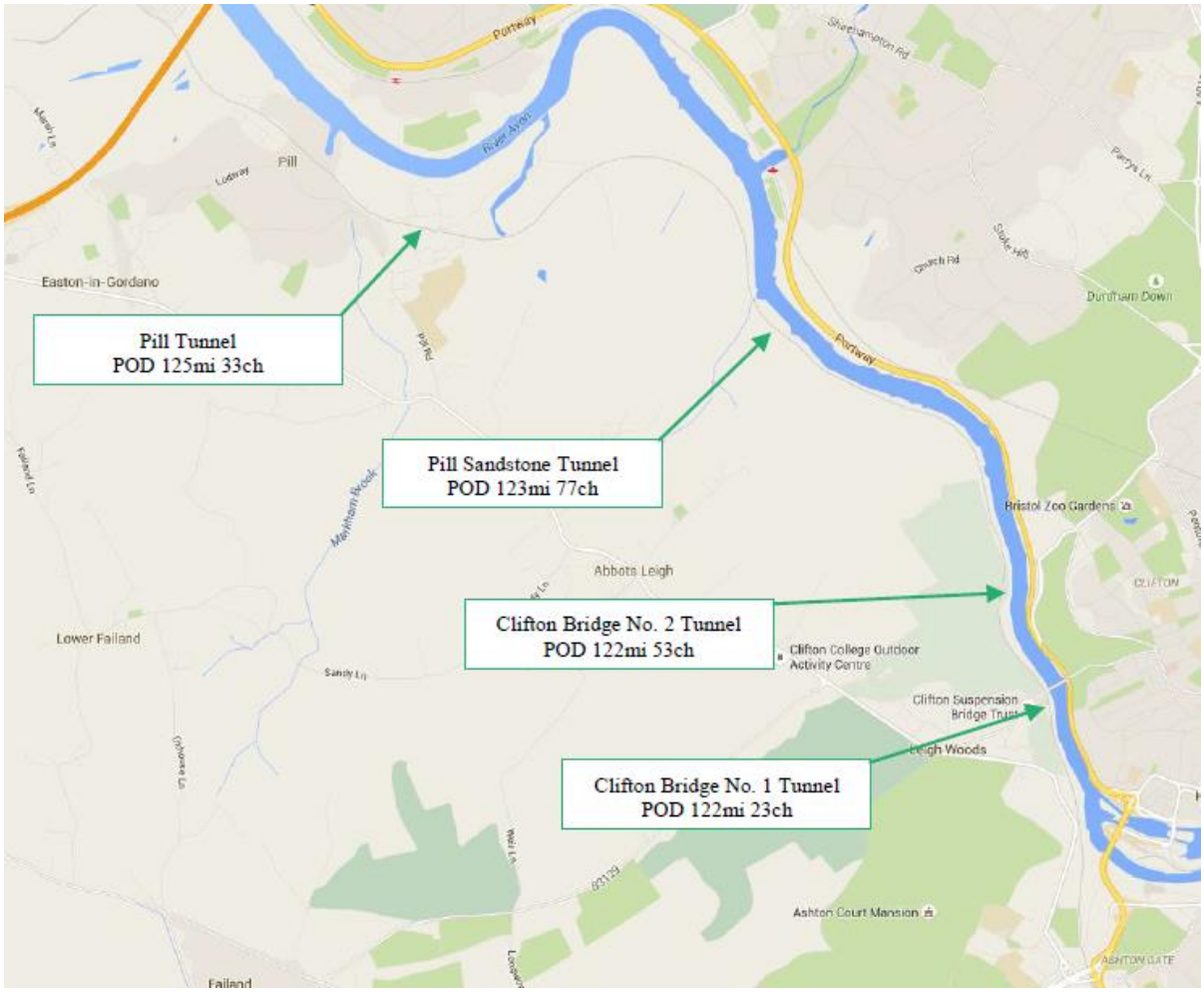


Figure 3.2 Locations of the tunnels on the existing operation railway

Minor Works to Bridges

3.2.35 A number of bridges along the Avon Gorge section of the line require strengthening works and minor repairs. Spandrel wall tie bars and pattress plates will be installed to strengthen the following bridges: S14 Bridge, S15 Miles Dock; S18 Quarry 6; S19 Quarry 5; S20 Quarry 4; S21 Quarry 3; and S25 Bridge. This involves using hand drills to drill through the spandrel wall structures. Tie bars will be installed through the width of the bridge and secured at each end with nuts, washers and the pattress plates.

3.2.36 Works will be undertaken either using roped access or use of small scaffolding towers which may require the removal of vegetation about 2 m from the structure.

3.2.37 S26 Valley Bridge is likely to require minor repairs and specific works are to be confirmed during detailed design. The works are expected to be small scale, involving the use of hand drills, an access tower and hand tools.

3.2.38 Drainage repair works will also be required at S12 Miles Viaduct Bridge over the upstream end of Ham Lakes comprising installation of a rod drainage system. It is likely that roped access will be required. The plant required may include hand tools, power drills, and access tower

and rope access equipment. It may be necessary to remove vegetation around the structure to accommodate the access tower. If required, mitigation measures will be taken prior to the start of works to protect the watercourse which flows under the bridge to Ham Lakes.

Retaining Walls

3.2.39 A structural survey has been completed for the retaining walls along the operational railway. In general, the retaining walls were found to be in a fair condition. Some local rebuilding of retaining walls at Chainages 122mi 79ch and 122mi 67ch will be undertaken due to local failure, such as bulging or rotation.

Geotechnical Works in the Avon Gorge

3.2.40 Slope instability is a known risk in the Avon Gorge, with recorded incidents of stones and boulders slipping downslope and rock falls. Stone picking, rock bolting and catch fences are already applied in the gorge to protect the freight line services.

3.2.41 Additional risk assessments of the geotechnical stability of the Avon Gorge cliff face close to the railway within NR railway land and on third party land have been undertaken for the DCO Scheme. The remedial works required as part of the DCO Scheme include hand picking loose stones and blocks, removal of trees which are causing root jacking in the cliff face, rock bolting to secure larger boulders and the provision of three new catch fences.

3.2.42 Access to the cliff slope may be from the top or bottom of the cliff faces. Access to the top of the cliff face would be via a road into Leigh Woods off Abbots Leigh Road, with temporary parking and welfare unit in the Abbots Leigh Road car park. Access to the base of the cliff would be from the railway or the River Avon Tow Path.

3.2.43 The scale of the works required to secure the rock face is small, dependent on manual labour, with staff lowered on ropes to pick off loose stones or undertake rock bolting using hand held equipment and local removal of vegetation. In some cases it may be possible to coppice rare species of trees which are causing root jacking to avoid future damage while saving the tree. Larger boulders will be allowed to slide downslope in a controlled way, although this could damage vegetation in the path of the boulder. Plant and equipment may include: hand tools, drilling rigs and a working platform.

Permanent Pedestrian Maintenance Access Points

3.2.44 A small permanent maintenance (pedestrian) access point will be located at the end of Chapel Pill Lane adjoining the railway (outside of the Avon Gorge Woodlands SAC). Further permanent accesses to the railway are proposed at three locations within the Avon Gorge Woodlands SAC from the neighbouring River Avon Tow Path for long term maintenance.

Works from Clifton Suspension Bridge to Ashton Junction

3.2.45 A new road rail access point and permanent railway maintenance compound is proposed between Clanage Road and the operational freight railway, to provide permanent access to the railway to enable

access north towards the Clifton Suspension Bridge and Avon Gorge. A ramp from the existing ground level to the railway will be provided to enable road rail vehicles to access the railway. Land within the compound will be lowered by about 10 cm to provide floodplain compensation for the ramp, as this site is location in Flood Zone 3b (ES Appendix 17.1 Flood Risk Assessment, DCO Document Reference 5.6).

3.2.46 Where the railway passes Ashton Vale, the existing level crossing will remain. An extension to the existing left turn lane into Ashton Vale Road will be provided. In addition, a new Microprocessor Optimised Vehicle Actuation ("MOVA") traffic control system, which is a traffic control measure designed to maximise operational efficiency of the junction, will be installed to regulate the traffic controls and to align them with the closures of the adjacent level crossing. A new ramp from Ashton Vale Road to Ashton Road will provide alternative access for pedestrians and cyclists when the barriers are down. Baron's Close Pedestrian Crossing, which was closed temporarily during the construction of MetroBus, will be closed permanently under the DCO Scheme.

3.2.47 A temporary construction compound will be used in the rail freight facility at Liberty Lane.

Railway Signalling and Communications Equipment along the DCO Scheme

3.2.48 New signals are required along the operational railway line between Ashton Junction and Portishead for the safe movement of passenger trains and freight trains in both directions along the single track railway and, given the short sight lines, through the Avon Gorge owing to the winding route and tunnels.

3.2.49 New cabling will be laid along a trough on one or other side of the railway and connected to small electrical cabinets placed periodically along the railway, including inside tunnels.

3.2.50 GSM-R masts and repeaters are required to ensure coverage of communications for the train drivers throughout the entire route. These are essential infrastructure for the safe management of the railway.

Replacement fencing

3.2.51 The existing fencing along both sides of the railway will be replaced between Portishead and Ashton Junction. It will be necessary to remove the existing vegetation 1 m on both sides of the fence line in install the new fence. The style of new fencing will depend on the risk level along the route.

Construction Programme

3.2.52 The current programme anticipates that construction would commence in Spring 2022 continuing to Winter 2023-24, with scheme opening in Winter 2023-2024.

Hours of Working

3.2.53 For the construction works along the operational railway line between Portbury Dock Junction and Ashton Junction, it will be necessary to arrange “possessions” to block freight train movements between Royal Portbury Dock and the Bristol to Exeter main line. The programme for the possessions has not been finalised at this stage, but will include: 24 hr to 100 hr possessions during the week or over weekends, and longer possessions for four to six weeks to complete specific works. As result, there will be night-time working and 24-hour working in shifts during week days and at weekends.

3.2.54 Possessions will not be needed along the disused section of the railway, so construction works will mostly be undertaken during the daytime. There may be a need for occasional night-time or Sunday working.

3.2.55 With the exception of works on the operational railway, the proposed working hours during the construction phase will adhere to normal daytime working hours (typically 6.00am to 6.00pm Monday to Saturday), with no working on Sundays, Bank or public holidays except as reasonably necessary and notified to the relevant planning authority and affected residents by an agreed notification procedure.

3.2.56 Working hours at construction compounds will depend on their use and the programme of construction activities. Some construction compounds may be operational for 24 hrs a day, while others are only used during specific construction operations. Some compounds may be used outside normal working hours for loading and unloading materials from road vehicles and or engineering trains.

Temporary Construction Compounds

3.2.57 The main construction compounds will be set up at Portishead Station, Sheepway, The Portbury Hundred, Lodway, the compound under the M5 Avonmouth Viaduct, Pill station car park site off Monmouth Road, Ham Green, and Clanage Road.

3.2.58 In rural locations, the top soil at construction sites will be stripped and stockpiled temporarily on site, and a Type 1 aggregate laid down to provide a working surface. On completion of the construction works, the aggregate would be removed and the soil replaced. Alternatively the soil may be treated to provide a load bearing surface by mixing it with a compound such as “Geobind”. On completion of the works, the soil is broken up and sodium bicarbonate added into the soil to return it back to its original state.

3.2.59 Other features of the main construction compounds may include: temporary site fencing, signage at the site entrance, temporary drainage, electricity generator, lighting, temporary noise bunds, water supply, portable / temporary wash room facilities, spill kits, bowsers to water down surfaces to reduce dust, wheel washers, and site parking for deliveries and the workforce.

3.2.60 Each of the main construction compounds will be set up to provide facilities needed to construct the DCO Scheme in the area, such as

temporary portacabins for offices and welfare facilities, storage for materials, segregated storage for different waste streams, and internal haul roads and pedestrian routes through the compound.

3.2.61 Several smaller satellite compounds are required to support the works, located at sites off Tansy Lane, the Wessex Water pumping station off the A369 Portbury Hundred, Avon Road Bridge, at the proposed Pill Station forecourt, by Pill Viaduct, at Chapel Pill Farm to support works at S-14 Bridge and at several sites through the Avon Gorge (such as Miles Dock, Quarry Bridge No. 6, Quarry Bridge No. 4, Quarry Bridge No. 2, Valley Bridge, and the Clanage Road access point on Clifton Bridge) and the public car park off Abbots Leigh Road in Leigh Woods.

3.2.62 As a minimum the satellite compounds will have space for a welfare unit to provide portable toilet and basic washing, cooking and rest facilities. The satellite compounds outside the Avon Gorge Woodlands SAC may also provide space for small scale deliveries, storage, and vehicle parking.

Construction Traffic

3.2.63 Wastes such as ballast, sleepers, rails and materials required for construction will be transported by road and rail. Along the existing operational railway, much of the transport of waste and materials will be done along the railway, due to the lack of vehicular access through the Avon Gorge. This is similar to the works undertaken in the early 2000s to re-open the railway line to the port and subsequently to refresh the ballast and rails in some locations.

3.2.64 Along the disused section of the railway between Portishead and Pill, several options have been considered for the temporary storage and movement of the waste ballast off site, which are described in the ES Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7). The options involve temporary storage of waste ballast within the Order limits either along the railway corridor and, or at the Portbury Hundred and Lodway construction compounds. It is likely that the ballast will be stored within the Order limits for the duration of the construction phase. The waste ballast may be transported off site via road haulage to a depot adjoining the railway in Royal Portbury Dock or Avonmouth, for loading onto trains and transportation to one of NR's recycling centres. Alternatively, once the railway is built to Portishead and before services commence, it would be possible to bring trains along the new railway and load the ballast directly onto them.

Operation

Proposed Service Pattern

3.2.65 The hourly service for the Portishead Branch Line entails passenger trains operating hourly all day between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. This provides up to 18 passenger trains in each direction per day (Monday to Saturday), with approximately 10 passenger trains in each direction on Sundays. An alternative 'hourly service plus' for the Portishead Branch Line entails passenger trains operating every 45 minutes during the am and

pm peak and hourly off peak, between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. This hourly service plus option provides up to 20 passenger trains in each direction per day (Monday to Saturday), with approximately 10 passenger trains in each direction on Sundays.

3.2.66 The assessment set out in this HRA has been undertaken on the basis of the 'hourly service plus' service of 20 passenger trains in each direction per day (Monday to Saturday), with approximately 10 passenger trains in each direction on Sundays. Both the ‘hourly service’ and the ‘hourly service plus’ option require exactly the same infrastructure.

Routine Maintenance Activities

3.2.67 All NR assets are subject to routine maintenance inspections and examinations. The existing maintenance regime will be increased due to the introduction of passenger services between Parson Street Junction and Portishead. Vegetation management during operation within the Avon Gorge SAC is detailed in NR’s SMS and Vegetation Management Plan (“VMP”) (Appendix 9.15 of the ES, DCO Document Reference 6.26).

3.2.68 Vegetation maintenance will be undertaken periodically to ensure adequate sight-lines along the railway and remove unstable trees and branches. The ballast and the cess must be kept clear of woody vegetation, and the ballast clear of 95% of other vegetation. The clearance includes the airspace above the ballast and cess, to avoid any overhanging branches near the railway. Where the line speed is 30 mph, a strip 3 m wide over the cess must be kept clear of vegetation on both sides of the rails.

Decommissioning

3.2.69 No specific plans have been formulated for the decommissioning phase of the Portishead Branch Line. It is expected that the services will continue for as long as there is a business case for doing so. Closure of railways is a regulated process, overseen by the Office of Rail and Road. Disposal of railway assets is also regulated by the Office of Rail and Road under the terms of NR's licence.

3.2.70 Railways are not designed to be decommissioned, although in accordance with paragraph 5.85 of the National Policy Statement for National Networks (“NPSNN”), development plan policies [and NR's Sustainable Development Strategy], consideration has been and will be given to the sustainability of materials used in construction, including their embodied carbon content, where choice is available. Some information on this is provided in Chapter 12 Materials and Waste (DCO Document Reference 6.15). For the NSIP, in the event that the train operating company decides to cease services on the Portishead Branch Line, it is likely that the railway assets will remain in place, as occurred after traffic ceased in the 1980s. Previous practice following railway closures suggests that the railway formation will remain available either for re-development over time or finding an alternative transport use such as a guided busway or a cycle path. Such proposals

would be subject to their own assessment including consideration of environmental effects. As such proposals are not reasonably foreseeable, the likely impacts cannot be assessed.

3.2.71 For any abandoned part of the railway track bed, vegetation would gradually encroach upon the railway line, with herbaceous plants, shrubs and trees gradually recolonising the railway corridor. The assets comprising the trackbed would gradually fall into disrepair due to the action of erosion and corrosion from rain, plants and animals. As the railway to be authorised by the DCO is largely laid at surface level between Portishead and Pill it is not anticipated that there would be material need for ongoing maintenance work for embankments or cuttings. Ongoing maintenance of the cuttings and embankments would still be required along the operational railway from the Port to the main line. Network Rail would probably recover (and ideally re-use) items of values such as wiring, signalling equipment and principal supply points for signalling equipment.

3.2.72 Remaining assets such as fencing would continue to be maintained. The bridges carrying highways over the DCO Scheme and public rights of way would continue to be maintained to standards appropriate for public use, as a result of the obligations of NSDC as local highway authority.

3.2.73 It is anticipated that the line between Royal Portbury Dock and Parson Street would remain open for services to the Port. The currently operational railway would remain open for freight traffic even if passenger services ceased and any decision regarding the cessation of freight services would be one for the Freight Operating Companies and Bristol Port Company, so decommissioning the operational railway is not considered relevant or foreseeable for assessing the DCO Scheme. Were any decommissioning of all or part of the operational railway to be proposed in the future, a separate project would be developed, which would be accompanied by a specific assessment of the implications for the Avon Gorge Woodlands SAC.

3.2.74 It is not anticipated that the associated development comprising highway works or car parks at Portishead would be altered as a result of the cessation of rail passenger services between Portishead and Bristol. Similarly, it is anticipated the car parks at Pill would remain as car parks. If development proposals come forward in the future, the proposals would be assessed for their planning impacts and any environmental effects for the local planning authority to consider. Changes to the UK's use of fuel for transport mean that the nature of emissions from vehicles undertaking any removal of items could only be a matter of speculation.

3.2.75 For the reasons set out above, it is not possible to identify realistic options for decommissioning for assessment and no basis on which to consider that there would be reasonably foreseeable significant environmental impacts resulting from decommissioning.

SECTION 4

Consultation

4.1.1 A summary of consultation activities relevant to the HRA is provided in Table 4.1. Further information on the consultation process is presented in Chapter 5 Approach to the Environmental Statement, in the ES (DCO Document Reference 6.8). These activities include a request for a Scoping Opinion, Discretionary Advice Service ("DAS") requests to NE and Stakeholder meetings with NE. The Scoping Report, Scoping Opinion and the Baseline Report are available on the Planning Inspectorate's website at the following address: http://infrastructure.planninginspectorate.gov.uk/projects/south-west/portishead-branch-line-metrowest-phase-1/?ipcsection=docs.

4.1.2 Natural England was consulted on a draft of the HRA Screening Report in early 2015 through their DAS. NSDC submitted a request for a Scoping Opinion to the Planning Inspectorate in June 2015, together with a Scoping Report and Baseline Report. The Scoping Report included the draft HRA and NE's response dated 5 February 2015. The Planning Inspectorate consulted with interested parties and provided a Scoping Opinion in August 2015 (DCO Document Reference 6.1). This included responses from NE and BCC on the HRA.

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
Scoping Opinion Responses (August 2015)		
Planning Inspectorate	Paragraph 3.49. Consider the need for a HRA.	A HRA has been undertaken and is presented in this document (Appendix 9.12 of the ES, DCO Document Reference 5.5).
Bristol City Council	Avon Gorge Woodlands SAC (and Avon Gorge SSSI). Full details required for works through the Avon Gorge Woodlands SAC. Need to define the limit of the works and extent of vegetation removal.	A summary of the works is presented in Section 3 of this report. Full details can be found in Chapter 4 Description of the Proposed Works of the ES (DCO Document Reference 6.7). Discussion of the impacts on the qualifying habitats of the Avon Gorge Woodlands SAC is provided in Sections 5,6, 7 and 8 of this report.
	The HRA needs to include assessment of works in the Portbury Wharf Nature Reserve on the Severn Estuary SPA and Ramsar site, the impact of horseshoe bats in relation to the two bat SACs (North Somerset and Mendip Bats SAC and Bath and Bradford-on-Avon Bats SAC) and works through the Avon Gorge Woodlands SAC.	The Severn Estuary SPA/Ramsar site (including consideration of indirect effects via the Portbury Wharf Nature Reserve) and the North Somerset and Mendip Bat SAC and Bath and Bradford-on-Avon Bats SAC are considered in this document.

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
Natural England	The potential indirect effects of the proposed development on greater and lesser horseshoe bats needs to be considered (also relating to SACs).	Effects on bats are considered in Section 9.6 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12) and in ES Appendix 9.2 Bat Technical Appendix Ver. 02 (DCO Document Reference 6.25). SAC bats are a assessed in this HRA report.
	Natural England advises that a habitat survey (equivalent to Phase 2) is carried out.	A flora survey has been completed in the Avon Gorge Woodlands SAC (ES Appendix 9.10 Flora Survey Avon Gorge Woodlands SAC / Avon Gorge SSSI, DCO Document Reference 6.25). More detailed habitat surveys were not considered necessary in other areas of the DCO Scheme.
	The ES should have regard to the requirements under the NPPF relating to Ancient Woodland.	The DCO Scheme will lead to a loss of ancient woodland within the Avon Gorge Woodlands SAC. The extent of loss, mitigation and compensation is discussed in ES Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12) and in this HRA (DCO Document Reference 5.5). The benefits of the development are discussed in Section 10 of this document
	Portbury Wharf Nature Reserve. Consider the indirect effect of the Scheme on birds in the Severn Estuary designated site.	These effects are assessed as part of EIA and HRA in section 9.6 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12) and sections 5, 6 and 7 of this document.

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
	Full details required for works through the Avon Gorge Woodlands SAC. Need to define the limit of the works and extent of vegetation removal. Consider the protection of interest features along the tow path and adjacent areas in Leigh Woods. Protection and management of rare species on cliff faces affected by the project. Treatment of invasive species. Impact of replacing security fencing should be considered, particularly in relation to rare whitebeams present along the edge of the railway line in some places.	A description of the works is presented in Chapter 4 Description of the Proposed Works of the ES (DCO Document Reference 6.7) and in Section 3 of this document. ES Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12) quantifies the impact of construction works on the habitat and important species, sets out how interest features will be protected and managed, stipulates management of non-native species will be managed and includes compensation measures such as planting rare whitebeam saplings. The impacts of the DCO Scheme are considered in detail within this HRA.
	HRA and Avon Gorge Woodlands SAC. Need to study bats in the Avon Gorge, although not a qualifying feature of the SAC. The HRA needs to include the assessment of works in the Portbury Wharf Nature Reserve on the Severn Estuary SPA and Ramsar site, the impact of horseshoe bats in relation to the two bat SACs (North Somerset and Mendip Bats and Bath and Bradford-on-Avon Bats SACs) and works through the Avon Gorge Woodlands SAC.	Various surveys of protected species and the flora of the Avon Gorge Woodlands SAC are presented in Appendices 9.1 to 9.10 of the ES (DCO Document Reference 6.25). Consideration of the potential impacts is provided in Section 9.6 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12). The potential for impacts on the Severn Estuary SPA and on the two bat SACs is considered in this document.
	Stated that an assessment of noise is needed to assess the impacts on designated sites and wildlife.	The impact of noise on designations and wildlife is presented in Section 9.6 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
		Document Reference 6.12) and in Sections 5, 6 and 7 of this document.
Informal micro-consultation on DCO scheme boundary (22 June to 3 August 2015)		
No issues regarding the HRA or the European sites were raised		
Stage 2 Formal Consultation (23 October to 4 December 2017)		
Natural England	NE highly valued the information and survey work which has been provided regarding the Avon Gorge Woodlands SAC within the NR ownership. However, await further project details to be able to advise on the likely significance. NE was not able to thoroughly assess the impacts on the notified features due to unavailability of final details of route alignment and other specifics. They need to see full proposals to determine whether mitigation measures are suitable. More information was required on the impacts and mitigation for the operations listed in Table 4.5 of the PEI Report (rock picking, modifications to the vertical and horizontal alignment replacing steel sleepers, ballast replacement, installing signals, and trenching and cabling).	Further project details confirmed and assessed in Section 9.6 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12) and Appendix 9.11 AGVMPVer. 02 and this report (DCO Document References 8.12 and 5.5). Further details provided and recognised throughout this report in respect of potential impacts and proposed mitigation/compensation in the Avon Gorge Woodlands SAC. Further project details confirmed and assessed in Section 9.6 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12) and Appendix 9.11 AGVMP Ver. 02 and this report (DCO Document References 8.12 and 5.5).
	NE supports the conclusion that the disused railway line as a linear landscape feature is important at a Regional level for movement of bats from the SACs.	LSE identified for the North Somerset and Mendip Bats SAC and the potential for adverse effects on integrity discussed in Section 8 of this report.

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
North Somerset District Council	An HRA is required for the Severn Estuary SAC, SPA, and Ramsar site and the Avon Gorge Woodlands SAC.	An HRA has been undertaken and addresses the European sites in this report.
Bristol City Council	The Council noted that a shadow HRA would be required for the DCO Scheme	An HRA has been undertaken and is presented in this Report.
Informal Stakeholder Consultation		
Natural England Meeting to discuss undertaking positive management on FC land as an alternative to NR land, 20th June 2019 (Severn Area Mendip Team member and Forestry Commission)	Compensation for impacts from the DCO Scheme could be undertaken outside of the SAC and reduce the 23 positive management areas on NR land. 2:1 positive management equating to 1.6 ha needs to be achieved across FC and NR land in total. NE to speak to specialists internally and then to FC about options for the DCO Scheme beyond the FC management plan and provide their opinion for positive management areas within FC land.	ES Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12) and this report to inform the HRA were updated to include an option to undertake positive management on FC land outside of the SAC as an alternative to some of the positive management on NR land.
Natural England NE DAS response following review of draft documents: • ES Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12) • ES Chapter 9 Ecology and Biodiversity (DCO	NE advised, for clarity, that the mitigation measures for Avon Gorge Woodlands SAC are summarised in the HRA rather than list the documents where it is detailed. NE supported planting of rare whitebeam trees, subject to further investigation and a site visit with NE. NE supported where the DCO Scheme can provide added value on non-NR land. Compensation by positive management on NR land needs to demonstrate that it is over and	This HRA report was updated to summarise mitigation measures. Further survey of the three planting sites for rare whitebeam trees undertaken by national whitebeam experts. Added value on non-NR land (felling by FC on their land) described in Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12) and 9.12 HRA Report (DCO Document Reference 5.5). Further clarification given in Appendix 9.12 HRA Report (DCO Document Reference 5.5) about

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
Document Reference 6.12) • ES Appendix 9.12 HRA (DCO Document Reference 5.5) • ES Chapter 11 LVIA (DCO Document Reference 6.14) • ES Appendix 9.2 Ver. 02 MetroWest Bat Report (DCO Document Reference 6.25) • GRIP 3 minor civils drawings 7th June 2019 (Severn Area Mendip Team member)	above the works that NR is required to do as part of its duties. NE advised that the HRA provides clarification on areas of vegetation subject to clearance 'in the future' (as referred on the Railway Landscape Plans (Disused Line)). It would be helpful to quantify losses and gains. NE encouraged additional planting (potentially outside of the railway corridor). NE supported the conclusion that there is no likely significant effect on European sites other than the Avon Gorge Woodlands SAC and North Somerset and Mendip Bats SAC following the screening assessment. NE suggested the use of the Defra biodiversity metric as a tool to be used in conjunction with ecological advice to quantify biodiversity net gain in the terrestrial environment and the incorporation of the 10 best practice principles developed by CIRIA/CIEEM/IEMA for those delivering biodiversity net gain.	how the positive management on NR land is over and above the works that NR are required to do. Areas of vegetation subject to clearance 'in the future' have been quantified and the proposal for planting outside of the disused line corridor (alongside the A369 Portbury Hundred) clarified, see ES Appendix 9.16 The Portbury Hundred proposed Tree Planting (DCO Document Reference 6.25). In developing compensation measures regard has been had to NE's description of the conditions of the units within the Avon Gorge SSSI to ensure that the measures proposed can be additional to the conservation measures. For example, criteria used by NE to assess whether favourable conservation status has been achieved or maintained includes thresholds. The compensation measures proposed by the DCO Scheme, in aggregation with the conservation measures that are not within the scope of the DCO Scheme, will enable the condition of the SAC to be improved to a standard that is above the threshold of favourable conservation status.

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
Natural England Meeting to discuss the draft HRA and draft Avon Gorge Vegetation Management Plan, 25th April 2019 (Severn Area Mendip Team member and Senior Planning Advisor Somerset, Avon & Wiltshire Team)	NE required clarification to separate the DCO Scheme mitigation/compensation in the AGVMP from NR's Site Management Statement and Vegetation Management Plan for the operational freight line. More information was required on planting and retaining vegetation on the three rare whitebeam planting sites. NE requested that consideration is given to enabling the clearance of trees on FC land to benefit the Avon Gorge Woodlands SAC NE clarified that their advice on the draft AGVMP on 7th June 2018 related to the ecological content of the plan, rather than the HRA process and requirements. The approach to the HRA has evolved in recent months which in turn has led to further discussion about the AGVMP in the context of mitigation and compensation measures under HRA.	ES Appendix 9.11 AGVMP Ver. 02 and 9.12 HRA Ver. 02 (DCO Document References 8.12 and 5.5) updated to separate NR's existing responsibilities from the DCO Scheme mitigation/compensation. DCO Scheme project team worked with NE and the FC to identify priority areas for positive management outside of the railway corridor. ES Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12) and 9.12 (this document) were updated to include an option to undertake positive management on FC land outside of the SAC as an alternative to some of the positive management on NR land. Further surveys and clarification of planting on the three whitebeam planting sites has been completed (ES Appendix 9.11 AGVMP Ver. 02, DCO Document Reference 8.12). A site visit is also proposed with the national whitebeam experts. A meeting with the FC was undertaken on the 23rd May. NR are having discussions with the FC about working together to enable tree clearance on FC land and MetroWest will potentially plant surplus rare whitebeam saplings propagated by the DCO Scheme on FC land.

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
Natural England Meeting to discuss the draft HRA, 28th March 2019 (Severn Area Mendip Team member and Senior Planning Advisor Somerset, Avon & Wiltshire Team)	NE queried whether the proposed whitebeam planting sites are secondary woodland. There was a question about how suitable the Clifton Bridge No. 2 Tunnel planting site would be. NE wanted to know what NR are committing to through their Site Management Statements ("SMS"). NE will check on a draft licence for Bristol rock-cress.	Further surveys and clarification of the current condition of the three whitebeam planting sites has been completed and is provided in Appendix K of ES Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12). This information was sent to NE for review. A translocation and planting strategy has been developed for Bristol rock-cress and included in ES Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12).
Natural England Teleconference to discuss the draft HRA, 21st March 2019 (Severn Area Mendip Team member)	NE wanted to understand further how nitrogen deposition in the Avon Gorge can be reduced. NE asked to see how alternative ways of undertaking works to avoid impacts was considered. Discussed further work being undertaken to assess operational lighting impacts on horseshoe bats at Pill Station.	Further clarification provided regarding nitrogen deposition and how alternative ways of undertaking the works have been considered in this report (Sections 6 and 9). Further work to assess and provide mitigation for the operational lighting impacts at Pill Station has been undertaken and is detailed in ES Chapter 9 Ecology and Biodiversity Ver. 02, Sections 9.6 and 9.7 (DCO Document Reference 6.12) and ES Appendices 9.17 and 9.18 (DCO Document Reference 6.25).
Natural England Teleconference to discuss updates to scheme design and potential impacts on the Avon Gorge Woodlands SAC	Further details still required on precise figures for habitat loss in the Avon Gorge Woodlands SAC particularly in respect of rock face works. Discussed whether positive management of habitats should be considered mitigation or compensation and what are appropriate locations for whitebeam planting.	Updated figures for habitat loss provided to NE on 10 December 2018 to a member of the Severn Avon Mendip Team (via e-mail). Mitigation relevant to the Avon Gorge Woodlands SAC is outlined in Section 8.4 of this report.

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
19th November 2018 (member of the Severn Avon Mendip Team).		
Natural England Meeting to discuss Quarry Bridge No. 2 site compound within the Quarry site owned by National Trust 12th July 2018 (2 Severn Avon Mendip Team members and Plant Specialist).	NE preferred a track-built method. Query over the exact compound area, survey of the de-vegetation area, location to be agreed for boulders and log pile. Queries regarding construction methodology, protection and reinstatement.	Provisional compound area and construction methodology, protection and reinstatement provided by NR (Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12). NR confirmed there is potential to carry out the work from the track using a rail mounted crane but this is subject to detailed design and Contractor's preferred methodology.
Natural England Meeting to discuss the draft AGVMP, 7th June 2018 (Severn Avon Mendip Team member and Plant Specialist).	NE recommended identifying more than one site for planting rare whitebeam saplings, investigate the use of cuttings to propagate Avon whitebeam *Sorbus avonensis* and ask that surplus propagated material from more widespread species should be offered to the SSSI landowners for planting.	Two additional planting sites for rare whitebeam saplings have been agreed with NR and the use of cuttings to propagate Avon whitebeam was considered.
Natural England Avon Gorge Walk through, 15 December 2016 with an NE National Plant Specialist	Although a formal response was not received from NE following this activity it appears that NE recognise the positive opportunities that the DCO Scheme can bring to the designated site, if the DCO Scheme is carefully managed and implemented.	Consideration for the opportunities for positive management of the Avon Gorge have been developed and are outlined in the ES and in ES Appendix 9.11 AVGMP Ver. 02 (DCO Document Reference 8.12).

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
Natural England Scheme Design and development meetings: 28th November 2016 30th June 2017 (Bat Specialist) 4th July 2017 (Severn Avon Mendip Team member).	**Avon Gorge Woodlands SAC:** Natural England understood that the DCO Scheme will cause temporary disturbance to the Avon Gorge and will result in the loss of a number of individual whitebeam trees, but they also recognise the positive opportunities that the Scheme can bring to the designated site that are over and above the conservation measures that could be required in accordance with Article 6(1) of the Habitats Directive for example: • The management of invasive and unfavourable species, • The reduction of scrub encroachment for important areas of grassland, • The identification and awareness generation of important habitat features, • The development of skills to promote the in situ and ex-situ propagation of whitebeam • The further development of a collaborative working partnership between stakeholders and landowners, particularly FC, to further the conservation objectives of the Avon Gorge. **North Somerset and Mendip SAC:** Natural England recognised that lesser and greater horseshoe bats regularly occur between Portbury Common and Royal Portbury Dock and the disused railway line appears to be an important	These measures have been incorporated into the development of the AGVMP Ver. 02 (Appendix 9.11 of the ES, DCO Document Reference 8.12). Natural England has also asked for consideration of the other important botanical species in the Avon Gorge, which are identified in Appendix 9.10 of the ES (DCO Document Reference 6.25). Positive opportunities have been incorporated into the development of the AGVMP Ver. 02 (ES Appendix 9.11, DCO Document reference 8.12). NE has also asked for consideration of the other important botanical species in the Avon Gorge, which are identified in Appendix 9.10 Flora Survey: Avon Gorge Woodlands SAC/Avon Gorge SSSI (DCO Document Reference 6.25). NR has attended the Avon Gorge and Downs Wildlife Project meeting. Attendance of NR at one of the meetings to update the group of progress toward the site objectives is recommended by NE (NR Site Management strategy, vegetation management plan and HRA for the Avon Gorge ("SMS"), 2018; Appendix 9.15, DCO Document Reference 6.25).

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
	corridor for bats with movement between the line and Brockley Hall Stables SSSI, a link with the North Somerset and Mendip SAC. Accordingly, NE requested that an additional radio tracking survey for bats be undertaken to further understand the importance of the rail corridor.	
Natural England Meeting on 4th December 2015 (Severn Avon Mendip Team member)	Preparation of an interim HRA and SSSI Assent to work in the Avon Gorge Woodlands SAC / Avon Gorge SSSI to remove vegetation in winter/spring 2016 to facilitate the inspection of structures and earthworks as part of the design studies.	HRA completed and agreed with NE. The vegetation clearance and surveys of structures were completed in 2016.
North Somerset District Council (NSDC) Ecology Team	The NSDC ecology team has been consulted on the DCO Scheme on a number of occasions, they have participated in a site visit and been party to a number of sessions outlining the approach to the DCO Scheme. They were broadly content with the approach but asked that measures to enhance the ecological setting of the route be considered wherever possible.	Consideration of these measures are provided in the AGVMP Ver. 02 (ES Appendix 9.11, DCO Document reference 8.12).
Avon Wildlife Trust	AWT provided species information for Portbury Wharf Nature Reserve. Discussed mitigation measures for Sheepway Maintenance Compound and potential compensation schemes in partnership with AWT.	Ornithological data are included in ES Appendix 9.3 (DCO Document Reference 6.25). Indicative planting is shown in the Sheepway Bridge Maintenance Compound and Landscaping Plan (DCO Document Reference 2.49), which was developed in consultation with NSDC, who now manage Portbury Wharf Nature Reserve.

Table 4.1: Summary of consultation responses relevant to the HRA

Organisation and date	Summary of response	Consideration within HRA
		From 2016, the management of the Portbury Wharf Nature Reserve was handed over from AWT to NSDC's Streets and Open Spaces Team.
Forestry Commission Site visit to Leigh Woods to an area outside of the Avon Gorge Woodlands SAC suggested by NE for positive management as an alternative to NR land, 8th July 2019 (Beat Forester, Bristol and Savernake West England Forest District, Forestry England)	Management options to benefit woodland habitat such as selective thinning by removal of planted beech, cherry and conifer trees, as well as selective coppicing of small leaved lime in coppice panels or a thin strip along the bottom of the slope discussed on site.	Appendix 9.11 AVGMP Ver. 02 (DCO Document Reference 8.12) and 9.12 HRA Report (DCO Document Reference 5.5) of the ES updated to include an option to undertake positive management on FC land outside of the SAC as an alternative to some of the positive management on NR land.

SECTION 5

Stage 1 Screening: Potential Impacts on European Sites

5.1 Introduction

5.1.1 This section identifies the European sites considered in Stage 1, Screening and describes the potential pathways for impacts. The search area for European sites was 10 km radius around the boundary of the DCO Scheme, extended to 30 km for sites with bats as a qualifying feature. The sites under consideration are shown in Figure 1 in Annex A of this report and described in Table 5.1.

5.1.2 This section describes the general activities during each phase of the DCO Scheme that could give rise to impacts on European sites and then identifies the specific risks for each of the European sites considered in the Screening Stage. The relevant baseline information for the sites subject to Screening is provided in Section 6 and the Screening summary is in Section 7.

5.1.3 For this stage of the assessment no protective measures have been taken into account.

Table 5.1 European sites identified for inclusion in the HRA Screening (Stage 1) assessment

Site Name and Distance from Order Limits (km)	Qualifying Features
Avon Gorge Woodlands SAC 3.8 km of the DCO Scheme crosses the site	Annex I habitats that are a primary reason for selection of this site: • 9180 *Tilio-Acerion* forests of slopes, screes and ravines *** Priority feature** Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)
Severn Estuary SPA Closest point is 0.08 km at Pill Marshes	Qualifies under Article 4.1 of the EC Birds Directive by regularly supporting an internationally important wintering population of Bewick's swan *Cygnus columbianus bewickii*, an Annex 1 species. Qualifies under Article 4.2 as a wetland of international importance by regularly supporting in winter over 20,000 waterfowl. Qualifies under Article 4.2 by regularly supporting in winter internationally important numbers of the following 5 species of migratory waterfowl: • Greater white-fronted goose *Anser albifrons*; • Shelduck *Tadorna tadorna*; • Gadwall *Anas strepera*; • Dunlin *Calidris alpina*; and • Redshank *Tringa totanus*. Passage Birds* *Passage birds are not qualifying features of the SPA. The status of UK SPAs in the 2000s: The Third Network Review (JNCC, 2016), reviewed the process of calculating non-breeding waterbird assemblages for SPAs and stated that “on most old SPA citations and in the second Review site accounts, the waterfowl assemblage was described as being “over-winter”. In practice, on many sites the largest numbers of some (largely wader) species occurs during autumn (August-October) and spring (April-June) passage periods. For more recent designations, NE has described the assemblage as “during the non-breeding season” and calculated it using counts from the spring and autumn passage periods, as well as winter (November-March). The five-year mean for a particular species could therefore be calculated potentially using yearly peaks from different seasons. The

Table 5.1 European sites identified for inclusion in the HRA Screening (Stage 1) assessment

Site Name and Distance from Order Limits (km)	Qualifying Features
	approach runs no risk of double counting between sites or between years and there is no problem with calculating the mean for individual species and summing them to reach an assemblage total. The SPA and Ramsar Scientific Working Group agreed on the scientific merits of this "during the non-breeding season" approach to calculating non-breeding waterbird assemblages and recommended this as a UK standard. (2010-11)." Therefore, to fully consider the effects of the DCO Scheme on the non-breeding season, passage birds have been assessed for LSE from the proposed development.
Severn Estuary SAC Closest point is 0.08 km at Pill Marshes	Annex I habitats that are a primary reason for selection of this site • 1130 Estuaries • 1140 Mudflats and sandflats not covered by seawater at low tide • 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • 1110 Sandbanks which are slightly covered by sea water all the time • 1170 Reefs Annex II species that are a primary reason for selection of this site • 1095 Sea lamprey *Petromyzon marinus* • 1099 River lamprey *Lampetra fluviatilis* • 1103 Twaite shad *Alosa fallax*
Severn Estuary Ramsar site Closest point is 0.08 km at Pill Marshes	• Ramsar criterion 1. The immense tidal range affects both the physical environment and biological communities. • Ramsar criterion 3. Due to unusual estuarine communities, reduced diversity and high productivity. • Ramsar criterion 4. This site is important for the run of migratory fish between sea and river via estuary. Species include salmon *Salmo salar*, sea trout S. *trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis,* allis shad *Alosa*, twaite shad A. *fallax,* and eel *Anguilla*. It is also of particular importance for migratory birds during spring and autumn.

Table 5.1 European sites identified for inclusion in the HRA Screening (Stage 1) assessment

Site Name and Distance from Order Limits (km)	Qualifying Features
	• Ramsar criterion 8. The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon *Salmo salar*, sea trout S. *trutta,* sea lamprey *Petromyzon marinus,* river lamprey *Lampetra fluviatilis,* allis shad *Alosa*, twaite shad A. *fallax*, and eel *Anguilla* use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad and twaite shad which feed on mysid shrimps in the salt wedge. • Ramsar criterion 5. Assemblages of international importance: Species with peak counts in winter: 70,919 waterfowl (5 year peak mean 1998/99-2002/2003). • Ramsar criterion 6 – species/populations occurring at levels of international importance. Species with peak counts in winter: Tundra swan, *Cygnus columbianus bewickii,* NW Europe 229 individuals, representing an average of 2.8 % of the GB population (5 year peak mean 1998/9-2002/3). Greater white-fronted goose, *Anser albifrons*, NW Europe 2076 individuals, representing an average of 35.8% of the GB population (5 year peak mean for 1996/7-2000/01). Common shelduck, *Tadorna tadorna*, NW Europe 3,223 individuals, representing an average of 1 % of the population (5 year peak mean 1998/9-2002/3). Gadwall, *Anas strepera,* NW Europe 241 individuals, representing an average of 1.4 % of the GB population (5 year peak mean 1998/9-2002/3). Dunlin, *Calidris alpina,* W Siberia/W Europe 25082 individuals, representing an average of 1.8 % of the population (5 year peak mean 1998/9-2002/3). Common redshank, *Tringa totanus*, 2,616 individuals, representing an average of 1 % of the population (5 year peak mean 1998/9-2002/3). • Species/populations identified subsequent to designation for possible future consideration under criterion 6: – Lesser black-backed gull *Larus fuscus graellsii* (breeding); Ringed plover *Charadrius hiaticula* (passage), Eurasian teal *Anas crecca* (winter), Northern pintail *Anas acuta (*winter).
North Somerset and Mendip Bats SAC	Annex I habitats that are a primary reason for selection of this site:

Table 5.1 European sites identified for inclusion in the HRA Screening (Stage 1) assessment

Site Name and Distance from Order Limits (km)	Qualifying Features
9 km	• 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia)* (* important orchid sites) • 9180 *Tilio-Acerion* forests of slopes, screes and ravines *** Priority feature** Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • 8310 Caves not open to the public Annex II species that are a primary reason for selection of this site: • 1303 Lesser horseshoe bat *Rhinolophus hipposideros* • 1304 Greater horseshoe bat *Rhinolophus ferrumequinum*
Chew Valley Lake SPA 9 km	Qualifies under Article 4.2 by supporting winter populations of European importance of migratory species: Shoveler *Anas clypeata*
Wye Valley Woodlands SAC 18.5 km	Annex I habitats that are a primary reason for selection of this site: • 9130 *Asperulo-Fagetum* beech forests • 9180 *Tilio-Acerion* forests of slopes, screes and ravines *** Priority feature** • 91J0 *Taxus baccata* woods of the British Isles *** Priority feature** Annex II species that is present as a qualifying feature, but not a primary reason for selection of this site: • 1303 Lesser horseshoe bat *Rhinolophus hipposideros*
Wye Valley and Forest of Dean Bat Sites SAC 19 km	Annex II species that are a primary reason for selection of this site: • 1303 Lesser horseshoe bat *Rhinolophus hipposideros* • 1304 Greater horseshoe bat *Rhinolophus ferrumequinum*
Mendip Limestone Grasslands SAC 21 km	Annex I habitats that are a primary reason for selection of this site: • 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • 4030 European dry heaths

Table 5.1 European sites identified for inclusion in the HRA Screening (Stage 1) assessment

Site Name and Distance from Order Limits (km)	Qualifying Features
	• 8310 Caves not open to the public • 9180 *Tilio-Acerion* forests of slopes, screes and ravines * Priority feature Annex II species present as a qualifying feature, but not a primary reason for site selection: • 1304 Greater horseshoe bat *Rhinolophus ferrumequinum*
Bath and Bradford-on-Avon Bats SAC 22 km	Annex II species that are a primary reason for selection of this site: • 1304 Greater horseshoe bat *Rhinolophus ferrumequinum* • 1323 Bechstein`s bat *Myotis bechsteinii* Annex II species present as a qualifying feature, but not a primary reason for site selection: • 1303 Lesser horseshoe bat *Rhinolophus hipposideros*
Mells Valley SAC 24 km	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) • 8310 Caves not open to the public Annex II species that are a primary reason for selection of this site: • 1304 Greater horseshoe bat *Rhinolophus ferrumequinum*

5.2 Identification of Potential Impacts

Construction Phase

5.2.1 During construction, the potential impacts on European sites are as follows:

- Temporary habitat loss, where vegetation is anticipated to recover, albeit with varying timescales and possibly with different characteristics, as a result of the following activities.
  - Excavations to remove ballast; placing of new ballast, sleepers and rails; troughing for cabling and drainage works.
  - Temporary changes in land use, including vegetation removal, for construction compounds and haul roads, particularly on green field sites along the disused railway.
  - Temporary vegetation clearance prior to re-profiling and strengthening embankments and cuttings, possibly including piling and soil nailing.
  - Geo-technical works to rock faces in the Avon Gorge, including inspections of the rock face and scaling of the rock face, the installation of rock bolts and block removal, and erection of catch fences to the bottom of the slope.
  - Reconstruction of Quarry Bridge No. 2 and remedial works to existing bridges.
- Permanent habitat loss where vegetation removal is needed for new infrastructure e.g new fence, maintenance and emergency access compounds, headwalls of culverts, new access steps, telecommunications masts and signalling, and repair works to structures such as bridges and tunnel portals. Vegetation removal would be required 1 m either side of the fenceline to replace or upgrade existing fencing along both sides of the railway for the majority of its length between Portishead and Ashton Junction. Vegetation would be allowed to regenerate outside the fence and therefore some of this loss is considered temporary. Inside the fence, it is assumed that the fenceline will be kept clear of vegetation (i.e. a permanent loss), but it is likely that regeneration will occur in places where the fenceline is some distance from the rail.
- Disturbance of bats due to minor remedial works in the tunnels.
- Disturbance of birds and other fauna due to noise and vibration from construction operations e.g. piling, earthmoving equipment and construction traffic.
- Visual disturbance of birds and other fauna due to the presence of construction workers, plant and machinery.
- Disturbance of fauna, including bats and otter, from illumination and noise during night works.
- Changes in plant physiology and species composition due to air pollution from dust and exhaust fumes.

- Damage and changes in species composition of aquatic flora and fauna assemblages, due to possible pollution of watercourses.
- Damage to vegetation due to trampling and possible spillages of pollutants such as fuel or oil.

Operational Phase

5.2.2 During operation, the potential impacts are as follows:

- Increase in frequency of trains above the current freight line frequency causing potential disturbance due to visual intrusion, noise and vibration.
- Ongoing vegetation management as part of standard NR maintenance. This entails de-vegetation and periodic application of herbicides of the area 3 m from the running rail. There will also be localised removal of vegetation in areas where there are access points and equipment or structures to maintain. Anything overhanging or posing a danger to the railway, would also be removed.
- Annual inspections and periodic maintenance of rock faces through the Avon Gorge.
- Periodic use of the permanent maintenance compounds at Sheepway, Pill, Ham Green and Clanage Road for maintenance activities.
- Increase in recreational disturbance due to improved accessibility.
- Contamination in drainage and run-off and possible fuel spills during maintenance activities.
- Air quality changes due to an increased movement of trains and changes in traffic movements associated with the rail line.

Decommissioning Phase

5.2.3 There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed.

5.3 Potential Effects on Designated Sites

Avon Gorge Woodlands SAC

5.3.1 The design of the DCO Scheme has been developed with particular regard to the sensitivity of the Avon Gorge Woodlands SAC and the objective of minimising the extent of vegetation loss, particularly the removal of rare whitebeams. The works required to upgrade the existing operational railway line through the Avon Gorge Woodlands SAC are summarised in Table 5.2. All the works fall within the NSDC and BCC administrative boundaries and are within NR's operational boundary except for the geo-technical works on third party rock faces. All these works are part of the Associated Development works for the DCO Scheme.

Table 5.2: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
Track Works	
Minor modifications to the vertical and horizontal alignment of the existing railway line to achieve the required line speed and passenger comfort. The horizontal displacement is typically in the order of 2 to 3 centimetres and does not materially alter the footprint of the track and ballast.	Various locations along the railway line.
Replacement of the track and ballast including site preparation, de-vegetation, soil/ballast removal, ballast track lifts, re-railing, replacement of occasional sleepers.	The whole length of the operational railway through the Avon Gorge Woodlands SAC.
Geotechnical Works Subject to further assessment at Governance for Railway Investment Projects ("GRIP") 5	
Geotechnical stabilisation works on cliff faces on NR and third party land. The main activities are: • Partial de-vegetation of the cliff faces • Loose rock picking off cliff faces, • Rock bolting, • Four sections of new catch fences, each 2 m high and between about 30 and 160 m long to the foot of the cliff secured by anchors.	See General Arrangement Plans Sheets 9 to 13 DCO Document Reference 2.4 for the location of cliff faces and works required. Temporary access is required from the top of some of the cliff faces.
Geotechnical works on slopes within NR land Removal of loose blocks Removal of trees causing root jacking. Apply rock bolts Possible requirement for additional catch fence which could be incorporated into the boundary fence.	122mi 7.5ch to 122mi 9.5ch 122mi 25ch to 122mi 31.5ch 122mi 37.5ch to 122mi 38.5ch 122mi 50.5ch to 122mi 52.2ch 122mi 62.5ch to 122mi 63.5ch 122mi 66ch to 122mi 68ch 123mi 02ch to 123mi 04ch 123mi 12.5ch to 123mi 16ch 123mi 43.5ch to 132mi 47ch 123mi 75ch to 123mi 77.5ch 124mi 01ch to 124mi 2.5ch 124mi 11.5ch to 124mi 26.5ch
Geotechnical works on slopes on third party land Subject to further assessment in GRIP 5 Depending on location: Vegetation removal Light scaling of cliff face Removal of loose blocks which are an immediate risk to the railway. Apply rock bolts.	122mi 15.5ch to 122mi 17ch 122mi 20.5ch to 122mi 22.7ch 122mi 25.7ch to 122mi 31.8ch 122mi 5.01ch to 122mi 52.7ch 122mi 63.2ch

Table 5.2: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
Notify landowner of failures on their land where appropriate Erect three catch fences to the foot of the slopes.	122mi 68.2ch to 122mi 70.5ch 122mi 77.3ch to 123mi 4.1ch 123mi 15.7ch to 123mi 16.8ch 123mi 44.3ch to 123mi 50.0ch
Structures	
Minor works to repair railway bridges. • Miles Dock Bridge (S15) • Quarry Bridge No. 6 (S18) • Quarry Bridge No. 5 (S19) • Quarry Bridge No. 4 (S20) • Quarry Bridge No. 3 (S21) • Bridge (S25 • Valley (S26). Minor strengthening works e.g. spandrel wall tie bars and pattress plates required. Removal of vegetation around the structures and erection of scaffolding to complete the works using small scale drills and hand tools. Localised earthworks associated with the bridge repairs.	124mi 08ch 123mi 64ch 123mi 34ch 123mi 23ch 123mi 11ch 122mi 40ch 122mi 34ch See the General Arrangement Plans DCO Document Reference 2.4.
Quarry Bridge No. 2 (S22). Construct a new earth ramp from the railway to a temporary construction compound within the SAC. Partial dismantling and reconstruction of the bridge and abutments.	122mi 74ch See the General Arrangement Plan Sheet 12 DCO Document Reference 2.4.
Avon Gorge Tunnels • Some clearance of vegetation and loose debris around the tunnel portals. • Localised repairs and strengthening may be required to the tunnel linings. • Cabling clipping works. • Installation of cable trough. • Track renewal works in Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel and Sandstone Tunnel.	Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel, and Sandstone Tunnel.
Minor local repairs to retaining walls and earthworks to address localised failure due to bulging or rotation at two locations.	See General Arrangement Plans Sheets 11 and 12 DCO Document Reference 2.4. 122mi 79ch 122mi 67ch
Communications, signalling and cabling	
Installation of new GSM-R communications antenna and masts to provide coverage in the Avon Gorge.	Two repeater antennae mounted on a pole at the south end of Clifton Bridge No. 2 Tunnel and about 500 m from

Table 5.2: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
	the Clifton Suspension Bridge, with one antenna mounted at 8 m facing up the railway towards Clifton Bridge No. 1 Tunnel and the other mounted at 5 m pointing north into Clifton Bridge No. 2 Tunnel. Two repeater back to back antennae attached at 5 m to Sandstone Tunnel East (south) portal.
Installation of new signals with cabinets and associated telephones inside the SAC, to enable freight and passenger services to operate along the single track. Minor earthwork platforms may be required on which to seat the cabinets.	Locations to be confirmed at detailed design.
Troughing and cabling along the railway line associated with the new signalling and communications masts. Cables are laid in covered metal troughs usually flush with the ground surface.	The edge of the track along the entire length of the SAC.
Fencing and Access	
Replacement of the existing fencing along both sides of the railway corridor with Paladin style fencing typically 1.8 m high.	Along both sides of the railway along the entire length of the SAC, except where there are substantial natural boundaries, such as cliff faces, retaining walls or dense vegetation, or where the fencing has been de-scoped in the vicinity of Clifton Bridge.
New permanent access points to the railway line to facilitate maintenance: • Miles Dock (124m 07ch) • Quarry Bridge No. 5 (123m 33ch) • NR access gate to NR land (122m 79ch) • Near Valley Bridge (122m 30ch) Some of the access points between the River Avon Tow Path and the railway will be stepped up the embankment.	See General Arrangement Plans Sheets 10, 11, 12 and 13 DCO Document Reference 2.4.

5.3.2 The estimated area of qualifying habitat that require de-vegetation is described below. In addition, a small number of the above works will require the use of adjoining land on a temporary basis during construction, pending more detailed engineering design.

5.3.3 Qualifying woodland and grassland habitats within the SAC will be impacted by physical disturbance and habitat loss due installation of fencing, works to bridge structures, laying of new track, replacement of old track and ballast, installation of signalling and repeater masts and other associated structures. Individual trees including whitebeams *Sorbus* sp., will need to be removed for safety reasons, particularly those growing over tunnel portals and on cliff faces above the track. Appendix 9.11 AGVMP Ver. 02 of the ES (DCO Document Reference 8.12) provides information on vegetation removal in the Avon Gorge Woodlands SAC. It is estimated that up to 0.73 ha of SAC qualifying woodland and 0.06 ha of qualifying grassland could be lost, either permanently or temporarily, directly as a result of the DCO Scheme. These estimates are a worst case and represent approximately 0.69% of qualifying woodland and 0.84% of qualifying grassland within the SAC.

5.3.4 Ongoing vegetation management during the operational phase will also be required to maintain a clear 3 m either side of the running rail. However, this will not entail any further removal of vegetation beyond the extent estimated for the construction phase. It is anticipated that there will be some natural regeneration of vegetation either side of the fenceline, although the composition and characteristics of the vegetation is likely to be different to before clearance.

5.3.5 Remedial works on rock faces may necessitate the removal of woodland and grassland habitat including rare whitebeam species and may also affect other species that form part of the qualifying woodland and grassland habitats. Windthrow may affect qualifying woodland habitat, particularly areas of mature coppice, as they will be more exposed following the removal of front stands of trees (including land outside of NR ownership).

5.3.6 Additional impacts on SAC qualifying habitats may occur as a result of invasive species and pathogen transfer, as machinery and materials move across the site and disturbance and incursions to these areas from site personnel, machinery and storage of materials and equipment. There could be a risk of spillages of pollutants such as fuel and oil during construction and operational maintenance activities.

5.3.7 Chapter 7 of the ES, Air Quality and Greenhouse Gases (DCO Document Reference 6.10), assesses the impact of the DCO Scheme on air quality including possible changes in concentrations of nitrogen oxides (NO_x) and nitrogen deposition on the Avon Gorge Woodlands SAC. The Air Pollution Information System ("APIS"[1]) summarises the findings of scientific research on the responses of different habitats to air pollution. Some possible effects of pollution on the relevant woodland and grassland habitats in the Avon Gorge Woodlands SAC are given in Table 5.3.

Table 5.3: Summary of potential impacts of NOx and Nitrogen Deposition (derived from information on APIS website)

Pollutant	Broadleaved, Mixed and Yew Woodland	Calcareous Grassland
NO_x	Effects on growth, photosynthesis and nitrogen assimilation/metabolism with	Effects on growth, photosynthesis and nitrogen assimilation/metabolism with

[1] http://www.apis.ac.uk/

Table 5.3: Summary of potential impacts of NOx and Nitrogen Deposition (derived from information on APIS website)

Pollutant	Broadleaved, Mixed and Yew Woodland	Calcareous Grassland
	few species showing visible injury. Visible decline symptoms for example, leaf discoloration can occur at very high concentrations (> 400 ug m^3). Direct damage to mosses, liverworts and lichens, which receive their nutrients from atmospheric deposition, often leads to reductions in species diversity, but also leads to an increase in nitrogen-loving species.	few species showing visible injury. Visible decline symptoms for example, leaf discoloration can occur at very high concentrations (> 400 ug m^3). Direct damage to mosses, liverworts and lichens, which receive their nutrients from atmospheric deposition, often leads to reductions in species diversity, but also leads to an increase in nitrogen-loving species. Species composition changes.
Nitrogen Deposition	**Trees** Increased growth. Destabilisation; faster growth, reduced investments in roots leading to increased risk of drought stress and increased risk of uprooting. Nutrient imbalance, crown discoloration (chlorosis / yellowing) leading to reduced growth rates, reduced crown densities and abnormal branching patterns. Change in mycorrhizal flora. Increased litter production. N accumulation as NH4+ or amino acids leading to increased sensitivity to abiotic and biotic stress - reduced frost hardiness, associated with effects on late growth cessation and early bud burst, as young tissue is highly frost sensitive. Winter desiccation. Under-storey vegetation, ground dwellers and epiphytes. Loss of species diversity.	Reduced diversity and changes in species composition. Loss of rare or endangered species. Loss of characteristic mosses and lichens at risk from shading and N accumulation. Increase in non-native calcifuge species. Increased risk of drought effects. Reduction in pH in the surface soil. Increase in acid cations e.g. Al and Mn. Increased rates of mineralization and nitrification. Increase in soil N pool, which may have implications for the future habitat quality.

Table 5.3: Summary of potential impacts of NOx and Nitrogen Deposition (derived from information on APIS website)

Pollutant	Broadleaved, Mixed and Yew Woodland	Calcareous Grassland
	Loss of sensitive forbs and mosses and increases in nitrophilous plants especially grasses. Loss of lichens. **Soil chemistry and soil fauna** Acidification. Increased nitrate leaching. Changes in leaf litter chemistry. Changes in acidity has implications for soil fauna.	

Severn Estuary SAC, SPA and Ramsar site

Works near Portishead and Sheepway

5.3.8 The Severn Estuary SAC/SPA/Ramsar/SSSI is c1.2 km north of the closest point to the Portishead to Pill line but is functionally linked to the DCO Scheme via Portbury Wharf Nature Reserve. The southern end of the reserve adjoins the railway corridor between Portishead and Sheepway. However, the closest habitat used by SPA and Ramsar-qualifying species are the southern pools and lagoons approximately 650 m from the disused line. Therefore, the potential for impacts on SPA and Ramsar-qualifying bird species has been considered.

5.3.9 The anticipated works which could cause impacts on qualifying features at Portbury Wharf Nature Reserve are outlined below:

- Construction of the Trinity Primary School Bridge, which involves percussive piling, approximately 500 m from the pools and lagoons.
- Construction of the station at Portishead, approximately 900 m distant, which includes vegetation clearance and percussive piling.
- Installation and then use of a construction compound at Sheepway and a smaller permanent maintenance compound, approximately 650 m from the pools and lagoons.
- Construction of the line, approximately 650 m south of the pools and lagoons, involving removal of the existing ballast, sleepers and rails, followed by trackbed preparation and the laying of the new line.

Works at Pill

5.3.10 The disused line near Pill is c.80 m from the Severn Estuary SAC, SPA and Ramsar site. There are no works within the designated site, but a temporary cycle path diversion may come within 30 m of the SAC, SPA, Ramsar at Pill during the construction phase.

5.3.11 The anticipated works at Pill, which could cause impacts on qualifying features, are outlined below.

- Slewing of the existing operational railway between the Portbury spur and Pill Junction and construction of the new railway line from Portishead through to Pill Junction where both lines merge to a single line at a location between Pill Viaduct and Pill Tunnel western portal.
- Provision of a main construction compound at Lodway Farm and a compound under the M5 Avonmouth Viaduct, together with small compounds off Avon Road, at the proposed sites for the Pill Station car park off Monmouth Road and station forecourt, in the Pill Memorial club car park, and the parking area under Pill Viaduct on Underbanks and next to Pill Library. The Lodway construction compound will be used for the transhipment of materials recovered from the disused railway and for the delivery of materials. It will support facilities for materials storage, parking, welfare and offices. The M5 compound will be used for the access of road-rail vehicles. There may also be a small space for materials storage and a small welfare unit. The compound off Avon Road is for the location of the crane required to lift in pre-cast compounds of Avon Road Bridge. Other facilities may include a small welfare unit, small scale deliveries, storage and lay down area. The other compounds may be used to store materials, provide local welfare facilities, and small scale parking for vehicles and plant to support small scale works nearby. The construction compounds will be used during the day and for night-time working, depending on the construction activities.
- Widening and strengthening of the Avon Road embankment on the west side of Avon Road Bridge, the demolition and re-construction of Avon Road Bridge and temporary diversion of the NCN 41 to the north side of Jenny's Meadow and about 30 m from the Severn Estuary SAC/SPA/ Ramsar site.
- Temporary mobilisation of a large crane through Pill to Avon Road Bridge and the demolition and rebuilding of a property wall and demolition of a row of garages to accommodate the crane movements.
- Re-development of Pill Station including demolition of No. 7 Station Road to create a new forecourt and entrance to the station; cutting back, steepening and strengthening of Hardwick Road cutting; reconstruction of the southern platform and an emergency refuge area to the west of the platform; construction of a new ramp and staircase from the station entrance to the platform and minor works to the northern platform (which would remain unused).
- Repair works to Pill Viaduct
- Widening, steepening and stabilisation of Eirene and Mount Pleasant Embankment to accommodate the two railway lines and construction of Pill Junction;
- Construction of the new car park off Monmouth Road and the Pill Station forecourt;

- Modifications to the bus stop on Lodway near Pill Memorial Club to improve accessibility to the bus stop and sight lines for vehicle travellers;
- Replacement of drainage; and
- Landscaping works.

Potential Impacts

5.3.12 The potential for impacts on the Severn Estuary SAC, SPA and Ramsar is primarily via noise and visual disturbance of SPA and Ramsar-qualifying bird species and possible contamination via run-off and the risk of pollution events on the qualifying habitats of the SAC. The potential for air quality changes and effects on habitats of the Severn Estuary SAC has also been considered in Table 7.1.

5.3.13 The data used in the assessment of noise impacts during construction and operation are presented in Section 6.3, with the summary of assessment in Table 7.1.

5.3.14 The evidence used in the assessment of noise and visual impacts at Pill Marshes and Portbury Wharf Nature Reserve is drawn largely from the *Waterbird Disturbance Mitigation Toolkit* (Cutts, *et al*., 2013) and previous work on the Humber Estuary (Cutts, *et al*., 2009). These suggest that waterbird response to noise disturbance is likely to be minor at levels of 60 dB(A), with a low likelihood of birds flying away and abandoning the site (<10%).

5.3.15 The *Waterbird Disturbance Mitigation Toolkit* classifies noise responses by birds as follows:

- Low – noises of less than 55 dB at the bird are unlikely to cause a response. Noise between 55-72 dB in some highly disturbed areas may elicit a low level of disturbance provided the noise level was regular as birds will to often habituate to a constant noise level.
- Moderate – high level noise which has occurred over long periods so that birds become habituated to it or lower level noise which causes some disturbance to birds. This includes occasional noise events above 55 dB, regular noise 60-72 dB and long-term regular noise above 72 dB, where birds have become habituated.
- High - sudden noise event of over 60 dB at the bird or a more prolonged noise of over 72 dB may cause birds to move away from the works to areas which are less disturbed. Birds that remain in the affected area may not forage efficiently and if there are additional pressures on the birds (cold weather, extreme heat etc.) then this may impact upon the survival of individual birds or their ability to breed.

5.3.16 Due to distance (650 m), there is no impact due to visual disturbance of SPA and Ramsar-qualifying birds using the pools and lagoons at Portbury Wharf Reserve. Work by Cutts *et al*. (2009), suggests that there is no effect of visual disturbance due to people and machinery beyond 300 m. The distance between construction activity and the SPA at Pill Marshes is only 30 m, but this area is already used by dog-walkers and for other recreational activities.

5.3.17 There could be potential for run-off and pollution from construction and operational maintenance activities to reach the SAC/ SPA / Ramsar site, should the DCO Scheme be hydrologically linked to the designated sites.

5.3.18 The key water environment receptors within the study area that could potentially be affected by the DCO Scheme either during construction or operation have been identified (see ES Volume 2 Chapter 17 Water Resources, Drainage and Flood Risk (DCO Document Reference 6.20), ES Volume 4 Appendix 17.3 Water Receptors, (DCO Document Reference 6.25) and ES Volume 3 Book of Figures Figure 17.1 (DCO Document Reference 6.24).

5.3.19 The River Avon, which forms part of the designations, is classified under the Water Framework Directive ("WFD") (Cycle 2) as having Good Ecological Potential and Good Chemical Status. The Water Framework Directive Compliance Screening Assessment (Appendix 17.2, DCO Document Reference 6.25) concludes that no deterioration will occur as a result of the proposed works and that the DCO Scheme complies with the WFD.

5.3.20 At Pill, Pond 11 and ditches D15, D16 and D17 are located in/close to qualifying habitats of the SAC and Ramsar habitat (ES Volume 3 Book of Figures, Figure 17.1). Appendix 17.3 (DCO Document Reference 6.25) describes these water features and provides rationale for scoping them out of detailed assessment, as follows:

- Pond 11 - Scoped out as not hydrologically linked to watercourses and unlikely to receive direct discharge of railway runoff due to distance, therefore no pathway for pollutants.
- Ditch D15 - Scoped out as does not appear to be hydrologically linked to any watercourses.
- Ditch D16 - Scoped out due to distance from railway line and unlikely to receive discharges from railway runoff.
- Ditch D17 - Scoped out owing to distance from railway line unlikely to receive discharges from railway runoff.

5.3.21 Therefore, there are no identified pathways for pollution impacts during construction or operation on the qualifying features of the designated sites.

SACs which include bats as a qualifying feature

5.3.22 The following SACs are within 30 km of the DCO Scheme and include horseshoe bat species as qualifying species.

- North Somerset and Mendip Bats SAC (lesser and greater horseshoe bat)
- Wye Valley Woodlands SAC (lesser horseshoe bat)
- Wye Valley and the Forest of Dean Bat Sites SAC (lesser and greater horseshoe bat)
- Mendip Limestone Grasslands SAC (greater horseshoe bat)
- Bath and Bradford-on-Avon Bats SAC (lesser and greater horseshoe bat and Bechstein's bat), and
- Mells Valley SAC (greater horseshoe bat).

5.3.23 There will be no direct impacts on any SACs for which bats are a qualifying feature. The potential for impacts on the SAC bat populations exists if individuals forming part of the SAC population(s) use the habitats within the DCO Scheme, and the activities associated with the DCO Scheme affect this usage in any way, such as through:

- severance of commuting routes (e.g. via direct habitat loss or lighting);
- loss of foraging habitat;
- loss or damage to roosts (during construction);
- killing and injury (during construction via impact on roosts or during operation via collision risk during operation); and
- disturbance of roosting bats in tunnels during construction and operation.

SECTION 6

Baseline data

6.1 Introduction

6.1.1 Baseline information collected as part of the assessment of the DCO Scheme, and relevant to the HRA is summarised below. Full results of all ecological surveys undertaken for the DCO Scheme can be found in Appendices 9.1 to 9.10 of the ES.

6.2 Avon Gorge Woodlands SAC

6.2.1 Habitats relevant to the HRA are summarised below. These are habitats found within the Avon Gorge Woodlands SAC along the Portbury Freight Line. Further detail on the habitats within the DCO Scheme is found within ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12) and ES Appendices 9.1 Extended Phase 1 Habitat Survey and 9.10 Flora Survey: Avon Gorge Woodlands SAC/Avon Gorge SSSI (DCO Document Reference 6.25).

Woodland habitat

6.2.2 Woodland dominates the adjacent habitat and banks of the Portbury Freight Line. It is part of the *Tilio-Acerion* forests of the Avon Gorge Woodlands SAC and forms an almost continuous belt of woodland edge habitat along the bottom of the gorge, on the western side of the river. The railway habitats tend to be north-east to north-facing because of the slope of the gorge.

6.2.3 The *Tilio-Acerion* forests are broadly defined as being mixed forests of secondary species (*Acer pseudoplatanus, Fraxinus excelsior, Tilia cordata, Ulmus glabra*) on slopes of coarse screes, rocky slopes or colluvions comprising calcareous or siliceous substrates (European Commission, 2007). Much of the Avon Gorge woodland meets this definition. The extent of the *Tilio-Acerion* qualifying feature in the Avon Gorge Woodlands SAC is estimated at 105.75 ha (Natural England, 2019).

6.2.4 SAC qualifying woodland habitat along the Portbury Freight Line comprises both ancient semi-natural woodland and recent or secondary woodland habitat[2], the distribution of which are illustrated in Figure 2 of ES Appendix 9.10 Flora Survey: Avon Gorge Woodlands SAC/Avon Gorge SSSI (DCO Document Reference 6.25).

Ancient woodland

6.2.5 The woodland canopy is dominated by small-leaved lime *Tilia cordata* with beech *Fagus sylvatica*, ash *Fraxinus excelsior* and wych elm *Ulmus glabra*, with yew *Taxus baccata* associated with the more natural slopes, rocky outcrops and cliffs. Much of this is diverse ancient

[2] This assessment has taken a precautionary approach to the consideration of SAC qualifying woodland based on the information available. All ancient and secondary woodland has been assessed to be a qualifying feature of the SAC.

woodland of fairly typical composition but with occasional uncommon species in the ground flora such as lily-of the-valley *Convallaria majalis*. This woodland occurs on the natural rocks and slopes, for example around Clifton Bridge No. 1 Tunnel, Pill portal, and small widths within land bordering the railway. Other than small scraps on the steepest slopes and cliffs, it has been extensively managed.

Secondary (recent) woodland

6.2.6 Recent or secondary woodland are those woodlands which have developed on previously open ground from the start of the 17th century[3]. Photographs of the Avon Gorge near Clifton Bridge No. 2 Tunnel taken in 1937 show the land between the railway and the River Avon Tow Path as predominantly clear of trees[4] . This confirms that the woodland currently present at these locations must be recent.

6.2.7 Recent or secondary woodland (taller than 5 m) is the main woodland type along the railway cuttings, in quarries, and between the railway, the River Avon Towpath and the river. Species consist of small-leaved lime, oak *Quercus* sp., ash, English elm *Ulmus minor*, wych elm, hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, traveller's joy *Clematis vitalba*, bramble *Rubus fruticosus* and invasive non-native species such as holm oak *Quercus ilex*, sycamore *Acer pseudoplatnus* and Norway maple *Acer platanoides*. Much of this woodland is not diverse, but the more open areas are a key habitat for rare whitebeams (see below), whilst the woodland is young.

6.2.8 Woodland between the River Avon Tow Path and river are in NR ownership, such as between Quarry Bridge No. 6 and the Sandstone Tunnel. These have presumably grown up since the River Avon Tow Path fell out of use, and are relatively diverse, including lime, wych elm and rare whitebeams.

Rare whitebeams

6.2.9 Other than small areas of grassland, the habitat within NR land is woodland or wood-edge. The rocky cliff edges provide habitat for rare whitebeams, *Sorbus* sp., which are part of the SAC qualifying habitat *Tilio-Acerion* forests.

6.2.10 The Avon Gorge Woodlands SAC supports at least 21 species of whitebeam, including nationally rare species, several of which are Avon Gorge endemics. The botanical survey (see Appendix 9.10, DCO Document Reference 6.25) recorded seven nationally rare species on NR land within the Avon Gorge Woodlands SAC. A summary of their distribution along the railway line is given in ES Appendix 9.10 and illustrated on Figure 4 of ES Appendix 9.10 (DCO Document Reference 6.25).

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[3] www.woodlands.co.uk/owning-a-wood/managing-your-woodland-for-wildlife/03-chapter-1---identifying-woodland-types.pdf (accessed 20/5/19)

[4] www.gettyimages.co.uk/photos/avon-gorge-1937?phrase=avon%20gorge%201937&sort=mostpopular#license www.gettyimages.co.uk (accessed 20.02.2020).

Semi-natural dry grasslands and scrubland facies

6.2.11 There is very little grassland habitat within the railway corridor through the Avon Gorge as most of the habitat is shaded by woodland or dominated by scrub. Semi-natural dry grasslands and scrub facies are a qualifying feature of the Avon Gorge Woodlands SAC and there is an estimated 6.93 ha within the SAC as a whole (Natural England, 2019).

6.2.12 These communities are present in two places within the DCO Scheme, immediately south of Clifton Bridge No. 1 Tunnel and immediately north of Clifton Bridge No. 2 Tunnel. In both cases these communities are found on cliffs and ledges within the railway boundary, and grasslands on the associated tow path. Both areas are of key importance for maintaining the interest of the SAC and are further described below.

South of Clifton Bridge No. 1 Tunnel

6.2.13 At Clifton Bridge No. 1 Tunnel, there is a very diverse area of grassland on the 'ramp' (an area of SW facing limestone ledges) above the south end of the cutting by the tunnel. This has supported CG1 *Festuca ovina-Carlina vulgaris* / CG3 *Bromus erectus* grassland in the past but is now partly scrubbed over with privet *Ligustrum vulgare*, hawthorn *Crataegus monogyna*, traveller's joy *Clematis vitalba*, cotoneaster species and dogwood *Cornus sanguinea*. The Schedule 8 species spiked speedwell *Veronica spicata* is still present in abundance, with red valerian *Centranthus rubra*, sheep's fescue *Festuca ovina* and southern polypody *Polypodium cambricum*. The area requires management to restore it to SAC quality.

6.2.14 On the adjacent cutting cliff face there is more spiked speedwell in very sparse OV39 *Asplenium trichomanes - A. ruta-muraria* community to within 20 m of the tunnel entrance. Scrub at the cliff base and ivy climbing the face require control to maintain this population.

6.2.15 On the limestone rocks between the River Avon Tow Path and the railway there is another area of diverse vegetation which includes the OV39 *Asplenium trichomanes - A. ruta-muraria* community, small areas of CG2 *Festuca ovina-Avenula pratensis* grassland and more CG1 *Festuca ovina-Carlina vulgaris* grassland heavily invaded by scrub. These rocks support many rare plants including spiked speedwell, basil thyme *Clinopodium arvensis* and dwarf mouse-ear *Cerastium pumilum* and require management to restore to SAC quality.

North of Clifton Bridge No. 2 Tunnel

6.2.16 The north portal of the tunnel has open ledges which support rare plants in the OV39 *Asplenium trichomanes - A. ruta-muraria* community. There is a small population of the Schedule 8 Bristol rock-cress *Arabis stricta* about 5-10 m south of the tunnel exit on the ledges, growing with fingered sedge *Carex digitata*. This area is threatened by invasion of scrub, especially by different cotoneaster species.

6.2.17 Between the railway wall and the River Avon Tow Path there is a narrow band of rocks, which has fingered sedge and used to support Bristol rock-cress but is currently covered with open scrub with ash,

dogwood, privet and bramble. This requires management to restore it to SAC quality.

6.2.18 On the east side of the tow path on NR land is a narrow strip of CG3 *Bromus erectus* grassland which supports spring cinquefoil *Potentilla tabernaemontani* and field garlic *Allium oleraceum*. It is currently being colonised by open scrub and requires management to maintain it.

Air quality data

6.2.19 Chapter 7 of the ES, Air Quality and Greenhouse Gases (DCO Document Reference 6.10), assesses the impact of the DCO Scheme on air quality, including impacts on the Avon Gorge SAC. The assessment considers both NO_x concentrations and nitrogen deposition for the Base Year (2015), Do-Minimum (2021) and Do-Something (2021) scenarios[5]. Total NO_x concentrations and nitrogen deposition rates were estimated along two transects extending into the SAC, one extending from the operational railway line and one on the other end of the SAC extending from the A369 (Figure 7.3 Sheet 3 in the ES Volume 3 Book of Figures, DCO Document Reference 6.24).

6.2.20 The Air Quality Strategy ("AQS") NO_x objective for vegetation and ecosystems is 30 µg m^{-3}. All scenarios predict a negligible change in NO_x concentrations, all of which are lower than the objective (Tables 7.15 and 7.16 in Chapter 7 Air Quality and Greenhouse Gases, of the ES, DCO Document Reference 6.10).

6.2.21 Table 7.10 in Chapter 7 Air Quality and Greenhouse Gases of the ES (DCO Document Reference 6.10) reports data from the APIS website, indicating that the current nitrogen deposition rate for *Tilio-Acerion* forests in the Avon Gorge SAC is 29.7 kg N ha^{-1} y^{-1}, which exceeds the critical load of 15-20 kg N ha^{-1} y^{-1} for the relevant nitrogen critical load class of meso- and eutrophic *Quercus* woodland habitat[6]. The current deposition rate for semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia)* in the Avon Gorge SAC is 17.2 kg N ha^{-1} y^{-1}, which is within the critical load range of 15-25 kg N ha^{-1} y^{-1} for the corresponding nitrogen critical load class of sub-Atlantic semi-dry calcareous grassland.

[5] The selection of the base year for the local air quality assessment was dependent on the traffic modelling. Due to delays in the scheme development, the opening year is likely to be winter 2023/2024. The changes in traffic between 2021 and 2024 are unlikely to affect air emissions significantly or change the assessment results. Furthermore, the air quality assessment based on an opening year of 2021 is conservative as future year assessments take into account adoption of vehicle emissions control and turnover in the UK fleet. Consequently, the air quality assessment has not been updated for later opening years.

[6] http://www.apis.ac.uk/srcl/select-a-feature?site=UK0012734&SiteType=SAC&submit=Next

6.3 Severn Estuary SAC, SPA and Ramsar site

6.3.1 The Severn Estuary SAC, SPA and Ramsar site is 80 m from the route of the DCO Scheme at Pill Marshes. However, there are elements of temporary works that are closer to the designation, namely the temporary cycle path diversion at Jenny's Meadow in Pill, which is about 30 m from the designated sites. Portbury Wharf Nature Reserve, which provides functional habitat for SPA-qualifying bird species is adjacent to the railway corridor between Portishead and Sheepway. However, the closest habitat used by SPA and Ramsar-qualifying species are the pools and lagoons approximately 650m from the disused line.

Ornithological surveys

6.3.2 Ornithological surveys have been undertaken at Portbury Wharf Nature Reserve and at Pill Marshes and are reported in full in the ES Appendices 9.3a (Ornithology of Portbury Wharf Nature Reserve) and 9.3b (Wintering bird surveys) respectively (DCO Document Reference 6.25).

6.3.3 The counts of the SPA/Ramsar-qualifying species made during baseline surveys were compared with three sets of data.

- Wetlands Bird Survey ("WeBS")[7] data compiled by the British Trust for Ornithology[8]. The most recent WeBS data (2012/3 – 2017/18) have been used in this HRA report, and therefore numbers differ from those in Appendices 9.3a and 9.3b.
- SPA population estimates from the original SPA citation (1995). These data are five-year peak means from 1988/89 to 1992/93.
- SPA population estimates from the 2016 SPA Standard Data Form[9]. These data are five-year peak means from 1991/92 to 1995/96.

Pill Marshes

6.3.4 The ornithological survey in and around Pill Marshes recorded a total of 10 waterfowl species in the winter of 2014/2015, excluding those that were only recorded in flight. Of these, only one – redshank – is a

[7] WeBS data form the basis of five year "peak means" (i.e. the highest number of any given species at any one of the three monthly winter visits averaged over a five year time period) used in citations of European sites, so the figures produced are comparable and compatible with the numbers given within the site citations.

[8] Frost, T.M., Austin, G.E., Calbrade, N.A., Holt, C.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. and Balmer, D.E. 2016. Waterbirds in the UK 2014/15: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford. http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report Accessed from http://app.bto.org/webs-reporting/

[9] http://jncc.defra.gov.uk/pdf/SPA/UK9015022.pdf

qualifying species for the Severn Estuary SPA/Ramsar. The peak count of redshank was 28 during the January high-tide survey, when 26 birds were recorded roosting together on the north-eastern bank of the river; the remaining two birds were recorded on the upper shore. Otherwise, records of this species were generally of one to six birds feeding on the intertidal muds at low tide.

6.3.5 Table 6.1 indicates that the number of redshank using Pill Marshes was less than 1% of the most recent estimate of the SPA population.

Table 6.1: Summary of Redshank counts at Pill Marshes compared with published data

Data Set	Redshank Population Estimate in Severn Estuary SPA	Count at Pill Marshes as a percentage of estimated SPA population
Most recent WeBS 5 year average (2012/13-2017/18)	5720	0.49
2016 standard data form (uses 5 year average 1991/2-1995/6)	2330	1.20
Original SPA citation (1995 – uses 5 year average 1988/89–1992/3	2013	1.39

Portbury Wharf Nature Reserve

6.3.6 Portbury Wharf Nature Reserve supports a network of pools/lagoons surrounded by grazing marsh, grassland, hay meadows and hedgerows close to the estuary. The pools/lagoons are located in the northern part of the site closer to the estuary foreshore, and grassland meadow and associated ditch/hedge habitats are mainly in the southern part closer to the DCO Scheme (see Appendix 9.3a, Figure 1 (DCO Document Reference 6.25) for the layout of nature reserve and extent of habitat types present).

6.3.7 The southern end of the site adjoins the railway corridor (i.e. the DCO Scheme), with part of the field at its southern end proposed as a site compound area during the construction phase and as a maintenance compound in the operation phase.

6.3.8 Four years of WeBS bird data have been provided by AWT for the reserve, recorded between 2011 to 2015 inclusive. These data mainly relate to wintering waterbirds and are shown in Table 6.2. Breeding lesser black-backed gull is listed within the Severn Estuary Ramsar citation so is also included in Table 6.3.

6.3.9 The SPA/Ramsar qualifying bird species shelduck was present at very low percentages (less than 0.1%) of the SPA population. Gadwall were present at 12% of the cited population. The overall waterfowl assemblage contains up to 0.5% of the Severn Estuary SPA/Ramsar

assemblage as a whole. In addition, teal and pintail, which are mentioned on the Ramsar citation, were present at 0.3% and 0.03% of the cited populations. Breeding lesser black-backed gull were present at <0.01% of the cited populations.

6.3.10 These species all occupy the northern part of the reserve which is approximately 600 m north of the DCO Scheme.

Table 6.2: Key winter bird data of relevance to SPA/Ramsar designation – i.e. WeBS data for wintering birds (no records obtained for other cited species)

Winter birds (Dec to Feb incl)	Notable spp.	Portbury Wharf Reserve 4yr Peak Mean (AWT data, 2011 to 2015)	Severn Estuary SPA and Ramsar Most recent WeBS 5yr average (2012/13-2017/18)	Severn Estuary SPA and Ramsar 2016 standard data form (uses 5yr average 1991/2-1995/6)	Severn Estuary SPA and Ramsar Original SPA citation (1995 – uses 5yr avg 1988/89–1992/3
Black-headed Gull		32.8			
Canada goose		9.75			
Common gull		6.3			
Coot		53			
Cormorant		1.5			
Curlew		2.5			
Gadwall	SPA/ Ramsar	29	190 15.26%	282 10.28%	330 8.7%
Herring gull		63.3			
Jack Snipe		1.8			
Lapwing		45.3			
Lesser black-backed gull		2.5			
Little egret		0.3			
Little grebe		9			
Mallard		15.8			
Moorhen		19.3			

Table 6.2: Key winter bird data of relevance to SPA/Ramsar designation – i.e. WeBS data for wintering birds (no records obtained for other cited species)

Winter birds (Dec to Feb incl)	Notable spp.	Portbury Wharf Reserve 4yr Peak Mean (AWT data, 2011 to 2015)	Severn Estuary SPA and Ramsar Most recent WeBS 5yr average (2012/13-2017/18)	Severn Estuary SPA and Ramsar 2016 standard data form (uses 5yr average 1991/2-1995/6)	Severn Estuary SPA and Ramsar Original SPA citation (1995 – uses 5yr avg 1988/89–1992/3
Mute swan		11.75			
Pintail	Ramsar	0.3	745 0.04%		
Pochard		3.3			
Scaup		0.3			
Shelduck	SPA	2.3	4450 0.05%	3330 0.07%	2892 0.08%
Shoveler		17.8			
Snipe		6.3			
Teal	Ramsar	13.8	4456 0.31%		
Tufted duck		14			
Water rail		0.5			
Wigeon		110			

Table 6.3: Breeding bird data of relevance to Ramsar designation

Ramsar breeding birds (March to June inclusive)	Peak Mean (AWT data 2011-2015)	Estimated SPA Populations	% of cited population
Lesser black-backed gull	2.5	4167 nests	0.06

Noise assessment

6.3.11 Pill Marshes and the adjacent intertidal section of the River Severn are currently subject to a range of noise and visual disturbance, including the freight rail traffic, M5 traffic and dog walkers. The noise model (ES Chapter 13 Noise and Vibration, DCO Document Reference 6.16, and Table 7.103 of ES Appendix 13.7, DCO Document Reference 6.25) indicates an existing noise level at the SPA at Pill of about 59 dB $L_{Aeq,16h}$. Noise levels have been predicted for the boundary of the

Severn Estuary SPA at the closest point to works at Pill (approximately 80 m) for different construction activities (Table 6.4 below). Vegetation removal is predicted to produce the highest noise level at the SPA boundary of 69 $L_{Aeq,12h}$ dB (Table 7.103 of ES Appendix 13.7, DCO Document Reference 6.25) but will not be continuous and will last for no more than one or two weeks (paragraph 13.6.25 of Chapter 13 Noise and Vibration of the ES, DCO Document Reference 6.16). Noise levels of 55-72 dB in areas that are already highly disturbed are considered unlikely to cause a response (Cutts *et al.,* 2013), providing the noise level is regular as birds will to often habituate to a constant noise level (paragraph 5.3.15 of this report). Furthermore, Pill Marshes is used by so few SPA-qualifying birds (Table 6.1 of this report), that no LSE due to noise or visual disturbance is predicted.

6.3.12 During operation of the DCO Scheme, no noticeable change in the daily exposure level of 59 dB $L_{Aeq,16h}$ at Pill Marshes is predicted (Table 7.103 of ES Appendix 13.7, DCO Document Reference 6.25). However, the SPA boundary is about 80 m from the running rail and when the trains are passing these will be audible. The maximum levels due to passing trains are predicted to be 74 dB L_{Amax} at 60 m and 71 dB L_{Amax} at 120 m (paragraph 3.1.4 of ES Appendix 13.3, DCO Document Reference 6.25). The passage of the trains will only be audible for a short period of time and the increase and decrease in noise will be gradual and not sudden. Given the SPA is currently exposed to noise from the M5 and from freight trains, the addition of the passenger trains is considered unlikely to increase the level of disturbance to the qualifying species of the SPA at Pill Marshes. Pill Marshes is used by so few SPA-qualifying birds (Table 6.1 of this report), that no LSE due to operational noise is predicted.

Table 6.4: Daytime noise levels at Severn Estuary SPA at closest point to works in Pill

Construction activity	Distance (m)	Predicted combined[10] noise level $L_{Aeq,12h}$ dB
Vegetation removal	77	69
Vibratory piling at Avon Road Bridge	77	63
Excavation at the Avon Road Bridge	77	62
Ballasting / Tamping / Lining of the railway line	77	64
Percussive (hammer) piling at Hardwick Cutting at Pill Station	83	63
Percussive (hammer) piling for Avon Road embankment works	67	60

6.3.13 At Portbury Wharf Nature Reserve, the existing noise level at the most representative survey location for the pools and lagoons used by SPA and Ramsar-qualifying birds is 46 dB $L_{Aeq,16h}$ (Table 7.103 of ES Appendix 13.7, DCO Document Reference 6.25). The noise levels generated by construction activities in the vicinity of the reserve are shown in Tables 13.19 and 13.20 of ES Chapter 13 (DCO Document Reference 6.16). The works at Portishead Station are sufficiently distant (900 m) and attenuated by housing that there will be no discernible increase in noise at the pools. Construction of the haul route is the noisiest activity associated with the construction of the Sheepway compound (Table 13.20 in ES Chapter 13, DCO Document Reference 6.16), with a highest noise level of 68 dB $L_{Aeq,16h}$ at 50 m from the source of the noise. Given that the pools are 650 m from the compound, the noise levels are likely to be lower than levels found to cause disturbance of wetland birds (Cutts *et al.,* 2013, see paragraph 5.3.15 above).

6.3.14 The activities most likely to cause disturbance of birds using the pools and lagoons, due to noise levels and distance are the ballasting, tamping and lining works required for construction of the line (650 m from the pools and lagoons) and percussive (hammer) piling for approximately two weeks for the construction of the Trinity Primary School Bridge (500 m from the pools and lagoons).The predicted combined (baseline and construction) noise at the pools and lagoons is 49 dB $L_{Aeq,12h}$ from Ballasting/Tamping/Lining works and 49 dB $L_{Aeq,12h}$ from percussive (hammer) piling works at Trinity Primary School Bridge

[10] The combined noise level is the predicted noise from the construction activity added to the baseline noise level

(Table 7.103 of ES Appendix 13.7, DCO Document Reference 6.25). These are lower than levels found to cause disturbance of wetland birds (Cutts *et al.,* 2013, see paragraph 5.3.15 above) and therefore no impacts on SPA and Ramsar-qualifying birds are anticipated.

6.3.15 The pools and lagoons of Portbury Wharf Reserve are 650 m from the operational line and operational noise due to the passage of trains is expected to be below 30 dB $L_{Aeq,16h}$, resulting in no increase in noise at this location (paragraph 13.6.78 of ES Chapter 13 (DCO Document Reference 6.16). During operation of the Sheepway permanent maintenance compound, the highest noise level is predicted to be 63 dB $L_{Aeq,16h}$, due to vehicle movements, at 50 m from the source of the noise (Table 13.20 in ES Chapter 13, DCO Document Reference 6.16). Given that the pools and lagoons are 650 m distant, the noise levels at the pools are likely to be lower than levels found to cause disturbance of wetland birds (Cutts *et al.,* 2013, see paragraph 5.3.15 above).

6.4 SAC qualifying bat species

6.4.1 Bat activity surveys in 2015/2016 recorded ten species on the disused railway line including the Annex II species lesser and greater horseshoe bat, which are the qualifying features of a number of the SACs within 30 km of the DCO Scheme. The Annex II species Bechstein's bat, which is a qualifying feature of only one site, Bath and Bradford-on-Avon Bats SAC, was not recorded in the study area. Therefore there are potential pathways for impacts on lesser and greater horseshoe bats, but not on Bechstein's bat.

6.4.2 Lesser and greater horseshoe bats regularly occur between the Portbury Wharf Area and Royal Portbury Dock (ES Appendix 9.2 Ver. 02 Bat Survey Report). Greater horseshoe bat activity was highest at the west end of the disused railway line near Portishead and seasonal monitoring recorded peak levels of activity in June. Acoustic monitoring (with bat detectors) on the disused railway line has established that lesser and greater horseshoe bats occur on the site with both species being recorded during every month of survey. The study shows that the disused line is regularly used by lesser and greater horseshoe bats and the bats have been linked to the North Somerset and Mendip Bats SAC. The SAC bat population needs to move through the landscape between their roosts and their foraging areas in order to maintain 'Favourable Conservation Status'. Greater and lesser horseshoe bats require linear features in the landscape to provide landscape permeability because these species require sheltered, vegetated flight lines for their echo-location navigation. The semi-natural habitats on the disused railway line provides habitat continuity for the SAC bat populations and make a significant contribution to the landscape of broadleaved woodland, hedgerows and watercourses. The disused railway line habitats are therefore important to SAC bats in terms of quality and structure (allowing them to commute and forage).

6.4.3 The radio-tracking study of a male greater horseshoe bat in 2015 and a female greater horseshoe bat in 2018 demonstrated that there is movement between the disused railway line area of the DCO Scheme and Brockley Hall Stables SSSI and therefore a link with the North

Somerset and Mendip Bats SAC. However, the railway line is beyond the 'core sustenance zone' of Brockley Stables SSSI (which is broadly defined as key foraging habitats within 5 km of the SSSI) and is therefore not considered to be significant for breeding female greater horseshoe bats, or the rearing of their young. The male greater horseshoe bat was tracked 9.2 km from the disused railway line to Brockley Hall Stables SSSI over three nights in 2015, suggesting movement between satellite day roosts (Appendix 9.2 Ver. 02). The pregnant female tracked in 2018 was found to use a number of day roosts between Brockley Hall Stables SSSI and the disused railway line and used foraging areas approximately 9 km from the main breeding site at Brockley Hall Stables. This suggests the use of satellite roosts and extended foraging ranges is a strategy bats from Brockley Hall Stables may regularly adopt, and the North Somerset and Mendip Bats SAC greater horseshoe population have larger home range areas than previous studies have determined. The *North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document* (North Somerset Council, 2018) recognises habitats and features which support the populations of SAC bats outside the designated site are a material consideration in ensuring the integrity of the designated site.

6.4.4 Roosts of greater and lesser horseshoe were recorded along the DCO Scheme. Lesser and greater horseshoe bats were identified using a derelict store on the disused railway line as a night feeding roost (1 to 4 individuals maximum of each species). The two stone arches (Arches 1 and 2) on the disused northern platform at Pill station are used as a day roost by lesser horseshoe bats and a night roost by lesser and greater horseshoe bats. Low numbers of bats (1 to 4 individuals maximum) were recorded using the structures, with observational survey data confirming solitary animals shelter there during the summer. Acoustic monitoring of the site confirmed roosting is frequent.

6.4.5 The freight line, particularly between Pill Viaduct and Avon Road, is a sheltered corridor that could also be an important navigational route for horseshoe bats. Bat surveys using data loggers were undertaken along the freight line from Pill Viaduct to the junction with the disused line between May and October 2019 to determine the level of use of the navigational route by horseshoe bats. These data indicate that activity at, or close to Pill Station, is not strongly associated with the disused railway line, which is an important corridor for bats with movement between the line and Brockley Hall Stables SSSI, a link with the North Somerset and Mendip Bats SAC. Whilst there is likely to be some movement from the wider area, much of the lesser horseshoe bat activity appears to be localised and greater horseshoe bat activity through the station is too low to indicate that the site is an important commuting corridor.

6.4.6 Four tunnels on the Portbury Freight Line were assessed for bat roost activity between 2015 and 2018. The results of these surveys are summarised below in Table 6.5 in respect of Annex II species. No maternity roosts were identified. There is no evidence that the Portbury Freight Line tunnels attract high numbers of hibernating bats. Clifton

Bridge No. 1 Tunnel and Clifton Bridge No. 2 Tunnel are near to other known hibernation sites in the Avon Gorge and hibernation in these tunnels may be associated with movement between other underground sites such as caves, rock shelters and quarry mine shafts (in the vicinity of Portbury Freight Line). The tunnels are not considered to be important swarming sites; bat surveys in autumn recorded social activity and bats appear to use the shelter of the tunnels whilst socialising.

Table 6.5. Summary of tunnel survey results for Annex II bat species

Tunnel	Summer	Autumn	Winter
Clifton Bridge 1	No Annex II species recorded		
Clifton Bridge 2	Small (2 no.) number of lesser horseshoe bats recorded roosting during the day	Low numbers of greater and lesser horseshoes gathering and socialising	Low (2 no.) number of hibernating lesser horseshoe bats
Sandstone	n/a	Low numbers of greater horseshoes gathering and socialising	n/a
Pill	n/a	Low numbers of greater horseshoes gathering and socialising	n/a

SECTION 7

Summary of Screening (Stage 1)

7.1 Effects of the DCO Scheme alone

7.1.1 The screening process identifies each of the qualifying interest features of the European sites listed in Table 4.1 and screens them in or out for LSE, as a result of the DCO Scheme. The screening exercise is presented in Table 7.1 with the Planning Inspectorate screening matrices provided in Annex D.

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
Avon Gorge Woodlands SAC	*Tilio-Acerion* forests	**Construction** Habitat loss due to vegetation clearance for the construction works; Habitat fragmentation as a result of habitat loss. Habitat degradation as a result of incursions and pollution events during construction. Habitat degradation due to potential spread of invasive species during construction. **Operation** Changes in ground flora composition as a result of changes to NO_x concentration and N deposition. Habitat loss and fragmentation as a result of ongoing vegetation maintenance. Indirect habitat loss as a result of windthrow following vegetation clearance.	Woodland dominates the adjacent habitat and banks of the Portbury Freight Line. It is part of the *Tilio-Acerion* forests of the Avon Gorge Woodlands SAC and forms an almost continuous belt of woodland edge habitat along the bottom of the gorge, on the western side of the river. Rare whitebeams are present along the route of the DCO Scheme trackside and on rock faces.	**Construction** Approximately 0.73 ha of *Tilio-Acerion* forest would be lost for fencing and other infrastructure such as signals and steps, including loss of rare whitebeams (LSE). No habitat fragmentation is anticipated as the route of the line already exists and vegetation removal will be removing vegetation away from the line and individual trees on rock faces (no LSE). Inadvertent trampling, incursion by machinery and the possibility of accidental spillages of pollutants could degrade qualifying habitats (LSE). Construction works could facilitate the spread on non-native invasive species (LSE) **Operation** Changes in NOx concentrations are negligible. The increase in N deposition is very small with increases in deposition rates of up to 0.1 kg N kg ha^{-1} yr^{-1} . The critical load for woodland vegetation is already exceeded (no LSE). Standard NR vegetation maintenance during the operation of the DCO Scheme will not be greater than the extent of vegetation clearance undertaken during construction, with no further habitat loss or fragmentation (no LSE). Windthrow events could be increased during operation (LSE).	Yes, LSE.
Avon Gorge Woodlands SAC	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites)	**Construction** Habitat loss due to vegetation clearance for construction works. Habitat fragmentation as a result of habitat loss. Habitat degradation as a result of incursions and pollution events during construction. Habitat degradation due to potential spread of invasive species during construction. **Operation** Habitat degradation, including increases in competitive tall	Although there is very little grassland habitat within the railway corridor, there is a bank of calcareous grassland above the south end of the cutting by Clifton Bridge No. 1 Tunnel. An area of limestone grassland within NR land is also present to the north of Clifton Bridge No. 2 Tunnel.	**Construction** Approximately 0.06 ha of SAC quality grassland would be lost due to new or replacement of fences, new access steps, work to rock-faces, a compound and work to replace Quarry Bridge No. 2 (see ES Appendix 9.11 AGVMP Ver. 02, DCO Document Reference 8.12) (LSE). No habitat fragmentation is anticipated as the route of the line already exists and vegetation removal will predominantly be removing vegetation away from the line (no LSE). Inadvertent trampling, incursion by machinery and the possibility of accidental spillages of	Yes, LSE.

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
		grasses and a decline in diversity as a result of changes in NOx concentration and N deposition. Habitat loss and fragmentation as a result of ongoing vegetation maintenance.		pollutants could degrade qualifying habitats (LSE). Construction works could facilitate the spread on non-native invasive species (LSE). **Operation** Changes in NOx concentrations are negligible. The increase in N deposition is small and remains within the critical load range for grassland vegetation (no LSE). Standard NR vegetation maintenance during the operation of the DCO Scheme is likely to be restricted to woody species and will not extend beyond the area cleared for construction. Therefore no further habitat loss or fragmentation of grassland (no LSE).	
Severn Estuary SAC	*Annex I habitats* Estuaries Mudflats and sandflats not covered by seawater at low tide Atlantic salt meadows Sandbanks which are slightly covered by sea water all the time Reefs	**Construction** Habitat degradation due to run-off of pollution. **Operation** Habitat degradation due to changes in air quality. Habitat degradation due to run-off of pollution.	At 73,715.4 ha, the Severn Estuary is the largest example of a coastal plain estuary in the UK and one of the largest estuaries in Europe. Approximately two thirds of the designation is composed of subtidal habitats and one third is composed of intertidal habitats. Salt meadow is present along the southern bank of the Severn Estuary.	**Construction** At its closest point, qualifying salt meadows habitat within the SAC are 80 m from the route of the DCO Scheme. At Pill, Pond 11 and ditches D15, D16 and D17 are located in/close to the SAC habitat but no hydrological connectivity was identified between the DCO Scheme and Atlantic Salt Meadow qualifying habitat (no LSE). No LSE for qualifying habitats which are estuarine or covered by seawater part or all of the time, due to lack of hydrological linkages. Even if run-off could reach the estuary, any change would be rapidly diluted due to the size of the estuary (no LSE). **Operation** In Pill, in the areas closest to the SAC, changes in traffic levels associated with the station are negligible. The air quality changes due to the DCO Scheme are minimal and the existing nitrogen deposition of 12.3 kg N ha^{-1} y^{-1} is well below the critical load for salt meadow habitat (20-30 kg N ha^{-1} y^{-1}) (Table 7.10 ES Chapter 7 Air Quality and Greenhouse Gases, DCO Document Reference 6.10) (no LSE). There is no potential for run-off or contamination in drainage from the operational scheme as there are no sources of pollution and no hydrological linkages.	No

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
				Drainage is to be improved; modern trains have sealed toilet tanks and contaminated ballast will have been replaced with clean ballast (no LSE).	
Severn Estuary SAC	*Annex II species* Sea lamprey *Petromyzon marinu*s River lamprey, *Lampetra fluviatilis* Twaite shad *Alosa fallax*	Habitat degradation due to pollution run-off (construction and operation)	River and sea lamprey use the Severn Estuary during migration to and from their spawning and nursery grounds in rivers. The Severn Estuary is a nursery area for juvenile Twaite shad, where they feed on plankton.	The subtidal habitats of fish are further than 250 m from the DCO Scheme (distance depends on tide). There is no potential for run-off of pollutants to reach the site due to a lack of hydrological linkages (no LSE).	No
Severn Estuary SPA	**SPA qualifying features:** *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding) *Tadorna tadorna*; Common shelduck (Non-breeding) *Anas strepera*; Gadwall (Non-breeding) *Calidris alpina alpina*; Dunlin (Non-breeding) *Tringa totanus*; Common redshank (Non-breeding) *Anser albifrons* albifrons; Greater white-fronted goose (Non-breeding) Waterbird assemblage. Passage birds.	**Construction** Construction noise, and human disturbance of over-wintering and passage birds **Operation** Operational noise and vibration from passing trains. Increased accessibility and potential for recreational disturbance	Surveys of Pill Marshes recorded very low numbers of wintering redshank (<1% of the SPA population) and no other qualifying features. At Portbury Wharf Nature Reserve, gadwall was recorded at c. 12% of the cited SPA population and shelduck at <0.1% of the cited SPA population. The overall waterfowl assemblage at Portbury Wharf Nature Reserve contains up to 0.5% of the populations of the Severn Estuary SPA as a whole.	**Construction** Pill Marshes and the adjacent intertidal section of the River Severn are currently subject to a range of noise and visual disturbance, including the freight rail traffic, M5 traffic and dog walkers. The noise model indicates an existing noise level at the SPA at Pill of 59 dB $L_{Aeq,16h}$ (ES Appendix 13.7 Table 7.103 (DCO Document Reference 6.25). Construction activities will generate additional noise (Table 6.4 of this report), but given the low numbers of birds and existing noise levels and visual disturbance, there is not predicted to be a significant impact on SPA birds (No LSE). At Portbury Wharf Nature Reserve, the SPA qualifying bird species shelduck and gadwall were recorded using the wetland areas in the northern part of the reserve which is approximately 650 m north of the DCO Scheme. Predicted noise levels at this location are 49dB $L_{Aeq,16h}$ (ES Appendix 13.7 Table 7.103 (DCO Document Reference 6.25), which is below the level at which disturbance responses would be expected (no LSE). **Operation** During operation of the DCO Scheme, no change in noise levels above 59 $L_{Aeq,16h}$ are predicted at Pill Marshes except when trains are passing. The maximum levels due to passing trains are predicted to be 74 dB L_{Amax} at 60 m and 71 dB L_{Amax} at 120 m (paragraph 3.1.4 in ES Appendix 13.3, DCO Document Reference 6.25). The SPA boundary is 80 m	No LSE alone but possible in-combination effects of disturbance (see Table 7.2).

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
				from the running rail at Pill. Given the SPA is currently exposed to noise from the M5 which dominates the noise climate in this area, the addition of the passenger trains is considered unlikely to increase the level of disturbance in the SPA (no LSE). Due to distance, there will be no discernible increase in operational noise at the pools and lagoons at Portbury Wharf Nature Reserve (no LSE). The DCO Scheme is unlikely to result in increased recreation in the Severn Estuary SPA. Pill Marshes are already subject to human disturbance due to dog-walkers and extensive residential and commercial areas nearby. Portbury Wharf Nature Reserve is not sufficiently close to any station stops to encourage additional visitors (no LSE).	
Severn Estuary Ramsar site	Ramsar features by criterion: 4 Migratory birds 5 Assemblages of international importance 6 Species / populations occurring at levels of international importance: Tundra (Bewick's) swan, *Cygnus columbianus bewickii* Greater white-fronted goose *Anser albifrons*, Common shelduck, *Tadorna tadorna* Gadwall *Anas strepera*, Dunlin *Calidris alpine,* Common redshank *Tringa tetanus.* Additionally, potential future designations under criterion 6 are: Lesser black-backed gull *Larus fuscus graellsii* (breeding) Ringed plover *Charadrius hiaticula (passage)*	**<u>Construction</u>** Construction noise, and human disturbance of over-wintering and passage birds **<u>Operation</u>** Operational noise and vibration from passing trains. Increased accessibility and potential for recreational disturbance	Surveys of Pill Marshes recorded very low numbers of wintering redshank and no other qualifying features. At Portbury Wharf Nature Reserve, gadwall was recorded at c. 12% of the cited population and shelduck at <0.1% of the cited population. Teal and pintail were present at 0.3% and 0.03% respectively of the cited populations.	**<u>Construction</u>** Pill Marshes and the adjacent intertidal section of the River Severn are currently subject to a range of noise and visual disturbance, including the freight rail traffic, M5 traffic and dog walkers. The noise model indicates an existing noise level at the Ramsar at Pill of 59 dB $L_{Aeq,16h}$ (ES Appendix 13.7 Table 7.103 (DCO Document Reference 6.25). Construction activities will generate additional noise (Table 6.4 of this report),but given the low numbers of birds and existing noise levels and visual disturbance, there is not predicted to be a significant impact on Ramsar birds (No LSE). At Portbury Wharf Nature Reserve, the Ramsar species shelduck, gadwall, teal and pintail were recorded using the wetland areas in the northern part of the reserve which is approximately 650 m north of the DCO Scheme. Predicted noise levels at this location are 49dB $L_{Aeq,16h}$ (ES Appendix 13.7 Table 7.103 (DCO Document Reference 6.25), which is below the level at which disturbance responses would be expected (no LSE). **<u>Operation</u>**	No LSE alone but possible in-combination effects of disturbance (see Table 7.2).

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
	Eurasian teal *Anas crecca* (winter) Northern pintail *Anas acuta* (winter)			During operation of the DCO Scheme, no change in noise levels above 59 $L_{Aeq,16h}$ are predicted at Pill Marshes except when trains are passing. The maximum levels due to passing trains was measured to be about 80 dB at 10 m and was predicted to be 74 dB L_{Amax} at 60 m and 71 dB L_{Amax} at 120 m (paragraph 3.1.4 in ES Appendix 13.3, DCO Document Reference 6.25). The Ramsar boundary is 80 m from the running rail at Pill. Given the Ramsar is currently exposed to noise from the M5 which dominates the noise climate in this area, the addition of the passenger trains is considered unlikely to increase the level of disturbance in the Ramsar (no LSE). Due to distance, there will be no discernible increase in operational noise at the pools and lagoons at Portbury Wharf Nature Reserve (no LSE). The DCO Scheme is unlikely to result in increased recreation in the Severn Estuary. Pill Marshes are already subject to human disturbance due to dog-walkers and extensive residential and commercial areas nearby. Portbury Wharf Nature Reserve is not sufficiently close to any station stops to encourage additional visitors (no LSE).	
Severn Estuary Ramsar site	Ramsar features by criterion: Criterion 1: Immense tidal range Criterion 3: Estuarine communities Criterion 4: Migratory fish Criterion 8: Fish communities	**Construction** Habitat degradation due to run-off of pollution. **Operation** Habitat degradation due to changes in air quality. Habitat degradation due to run-off of pollution.	n/a	**Construction** At its closest point, salt meadow habitats within the Ramsar designation are 80 m from the route of the DCO Scheme and about 30 m from the nearest construction activity. At Pill, Pond 11 and ditches D15, D16 and D17 are located in/close to the Ramsar habitat but no hydrological connectivity was identified between the DCO Scheme and Atlantic Salt Meadow habitat (no LSE). No LSE for other Ramsar habitats which are further away from the DCO Scheme and which are estuarine or covered by seawater part or all of the time, due to lack of hydrological linkages. Even if run-off could reach the estuary, any change would be rapidly diluted due to the size of the estuary (no LSE).	No

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
				The subtidal habitats of fish are further than 250 m from the DCO Scheme (distance depends on tide). There is no potential for run-off of pollutants to reach the site due to a lack of hydrological linkages (no LSE). **Operation** In Pill, in the areas closest to the SAC, changes in traffic levels associated with the station are negligible. The air quality changes due to the DCO Scheme are minimal and the existing nitrogen deposition of 12.3 kg N ha^{-1} y^{-1} is well below the critical load for salt meadow habitat (20-30 kg N ha^{-1} y^{-1}) (Table 7.10 ES Chapter 7, DCO Document Reference 6.10) (no LSE). There is no potential for run-off or contamination in drainage from the operational scheme as there are no sources of pollution and no hydrological linkages. Drainage is to be improved; modern trains have sealed toilet tanks and contaminated ballast will have been replaced with clean ballast (no LSE).	
North Somerset and Mendip Bats SAC	*Annex II species:* Lesser horseshoe bat *Rhinolophus hipposideros* Greater horseshoe bat *Rhinolophus ferrumequinum*	**Construction and Operation** Severance of commuting routes (e.g. via direct habitat loss or lighting). Loss of foraging habitat. Loss or damage to roosts (during construction). Disturbance to retained roosts during construction. Killing and injury (during construction via impacts on roosts or during operation via collision risk during operation). Disturbance of bats in tunnels due to increased frequency of train operation.	Parts of the DCO Scheme are located at the outer extent of, Zones B & C of the North Somerset 'Bat Consultation Zone' (North Somerset Council, 2018). Bat activity surveys along the disused railway part of the DCO Scheme show that it is an important corridor for bats. A radio-tracking study recorded greater horseshoe bat to Brockley Hall Stables SSSI identified a link with North Somerset and Mendip Bats SAC. Roosts of low numbers of lesser horseshoes have been identified within the DCO Scheme. Summer day roosts and winter hibernation roosts of low numbers of lesser horseshoe bats have been confirmed at Clifton Bridge No. 2 Tunnel.	Proven link via radio tracking between SAC bats and the DCO Scheme along the disused railway line. Vegetation clearance to facilitate the construction and operation of the DCO Scheme will result in the reduction and removal of a linear corridor of trees and scrub along the currently disused line. Although the loss of foraging habitat is negligible on a landscape scale, there could be severance of commuting routes. The change to the physical structure of the corridor could disrupt navigational features in several areas that bats rely on for movement through the landscape. At Royal Portbury Dock this will increase the permeability of light from adjacent sites (such as existing lamps within car compounds) on to the rail corridor, which may displace bats from flight lines, such as those that link under the M5 Bridge. There is no evidence that the bat roost at Pill Station is linked with bat activity recorded on the disused railway line (ES Volume 4 Appendix	Yes, LSE. The possibility of in-combination effects with Royal Portbury Docks is addressed in Table 7.2.

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
				9.2 Bat Technical Report Ver. 02 (DCO Document Reference 6.25) and therefore the lighting at Pill Station is not likely to affect bats from the SAC. However, given that the disused railway line habitats are important to SAC bats for commuting and foraging there is LSE. There may be minor disruption to the lesser and greater horseshoe roost in the derelict store near Sheepway during the construction period when vegetation is cleared but this roost is used by a maximum of four individuals of each species, the effect is temporary and no LSE is predicted. There is potential for disturbance of the bats roosting in the arches on the northern platform at Pill Station during construction and operation. Although the arches are to be retained, the southern platform will be lit during operation (with dimming of lights during periods of no activity) and it is possible that bats will abandon this as a roost site. However, these roosts support only 1 to 4 individuals of lesser and greater horseshoes and even if these roosts are lost or abandoned, no LSE is predicted. Collision risk is considered to be low as horseshoe bats are likely to stick close to vegetation off the line of collision risk and patterns of bat activity are dispersed (no LSE). The potential disturbance / displacement of lesser horseshoe bats from roosts within Clifton Bridge No. 2 Tunnel as a result of increased train frequency is not considered likely to have significant effects. Bats already experience disturbance from freight trains, only a small number of bats are likely to be affected and there is abundance of alternative natural roost features (such as caves) in the Avon Gorge Woodlands (no LSE).	
Chew Valley Lake SPA	SPA qualifying features: Shoveler *Anas clypeata* (over-wintering)	**Construction** Construction noise, and human disturbance of over-wintering and passage birds	Surveys of the disused line, Freight line and Pill Marshes did not record any Shoveler.	**Construction** Shoveler was present in the northern part of Portbury Wharf Nature Reserve, which is approximately 650 m north of the DCO	No

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
		Operation Operational noise and vibration from passing trains. Increased accessibility and potential for recreational disturbance.	4 year peak mean recorded 18 Shoveler at Portbury Wharf Nature Reserve (WeBS 2012-2015, ES Appendix 9.3a, DCO Document Reference 6.25).	Scheme. Predicted noise levels at this location are 49dB $L_{Aeq,16h}$, which is below the level at which disturbance responses would be expected. Furthermore, the shoveler at Portbury Wharf are unlikely to be connected to the Chew Valley Lake SPA population due to distance (9 km) (no LSE). **Operation** As the pools in the reserve are approximately 650 m from the DCO Scheme, no changes in operational noise are predicted at this distance (no LSE). Portbury Wharf Nature Reserve is not sufficiently close to any station stops to encourage additional visitors (no LSE).	
Wye Valley Woodlands SAC	Annex I habitats *Asperulo-Fagetum* beech forests *Tilio-Acerion* forests of slopes, screes and ravines *Taxus baccata* woods of the British Isles Annex II species Lesser horseshoe bat *Rhinolophus hipposideros*	**Construction and Operation** No potential effects on qualifying habitats. Potential effects on lesser horseshoe bat. Severance of commuting routes (e.g. via direct habitat loss or lighting). Loss of foraging habitat. Loss or damage to roosts (during construction). Killing and injury (during construction via impacts on roosts or during operation via collision risk during operation). Disturbance of bats in tunnels due to increased frequency of train operation.	Bat activity surveys along the disused railway part of the DCO Scheme show that it is an important corridor for bats. Roosts of low numbers of lesser horseshoes have been identified within the DCO Scheme. The tunnels have been identified as being used by lesser horseshoe bats.	**Construction and Operation** Research indicates lesser horseshoe bats forage in close proximity to roost sites. Habitat within 1 to 2.5 km of a nursery roost is quoted as being important for conservation management of this species (Bontadina *et al*., 2002). Hibernation roosts are typically within 5 km of the maternity roost. Given the distance from the site (18.5 km), no LSE are anticipated.	No
Wye Valley and Forest of Dean Bat Sites SAC	Annex II species Lesser horseshoe bat *Rhinolophus hipposideros and* Greater horseshoe bat *Rhinolophus ferrumequinum*	Potential effects on Annex II bats: Severance of commuting routes (e.g. via direct habitat loss or lighting). Loss of foraging habitat. Loss or damage to roosts (during construction). Killing and injury (during construction via impacts on roosts or during operation via collision risk during operation).	Bat activity surveys along the disused railway part of the DCO Scheme show that it is an important corridor for bats. Roosts of low numbers of lesser horseshoes have been identified within the DCO Scheme. Tunnels have been identified as being used by greater and lesser horseshoe bats.	Research indicates lesser horseshoe bats forage in close proximity to roost sites. Habitat within 1 to 2.5 km of a nursery roost is quoted as being important for conservation management of this species (Bontadina et al., 2002). Hibernation roosts are typically within 5 km of the maternity roost. The SAC is located on the opposite side of the Severn Estuary and outside of the foraging range of the DCO Scheme and direct impacts on	No

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
		Disturbance of bats in tunnels due to increased frequency of train operation.		roosts or daily foraging / commuting habitat of greater horseshoe bats from this SAC is therefore not anticipated. No LSE are anticipated.	
Mendip Limestone Grasslands SAC	*Annex I habitats:* Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) European dry heaths Caves not open to the public *Tilio-Acerion* forests of slopes, screes and ravines * Priority feature *Annex II species:* Greater horseshoe bat *Rhinolophus ferrumequinum*	No potential effects on qualifying habitats. Potential effects on greater horseshoe bat. Severance of commuting routes (e.g. via direct habitat loss or lighting). Loss of foraging habitat. Loss or damage to roosts (during construction). Killing and injury (during construction via impacts on roosts or during operation via collision risk during operation). Disturbance of bats in tunnels due to increased frequency of train operation.	Bat activity surveys along the disused railway part of the DCO Scheme show that it is an important corridor for bats. Roosts of low numbers of lesser horseshoes have been identified within the DCO Scheme. The tunnels have been identified as being used by greater and lesser horseshoe bats.	The SAC is c.21 km from the DCO Scheme. Bat Consultation Zones for the North Somerset and Mendip Bats SAC (North Somerset Council, 2018) are based on buffers around maternity roosts of up to 8 km for greater horseshoe bats and up to 2.44 km around greater horseshoe bats 'other roosts'. The DCO Scheme is not within 8 km of the Mendip Limestone Grasslands SAC. The Mendip Limestone Grasslands SAC is designated for its hibernation roosts of greater horseshoe bats which when active in winter have a home range of c. 2 km (pers. comm. via e-mail 27.11.18 Somerset County Council Ecologist) No LSE are anticipated.	No
Bath and Bradford-on-Avon Bats SAC	*Annex II species:* Greater horseshoe bat *Rhinolophus ferrumequinum* Bechstein`s bat *Myotis bechsteinii* Lesser horseshoe bat *Rhinolophus hipposideros*	No potential effects on qualifying habitats. Potential effects on Annex II bats. Severance of commuting routes (e.g. via direct habitat loss or lighting). Loss of foraging habitat. Loss or damage to roosts (during construction). Killing and injury (during construction via impacts on roosts or during operation via collision risk during operation). Disturbance of bats in tunnels due to increased frequency of train operation.	Bat activity surveys along the disused railway part of the DCO Scheme show that it is an important corridor for bats. Roosts of low numbers of lesser horseshoes have been identified within the DCO Scheme. Tunnels have been identified as being used by greater and lesser horseshoe bats. No Bechstein's bat records within the DCO Scheme.	Wiltshire Council (2015) provide advice on 'Core Areas' within which SAC bats should be considered for the Bath and Bradford-on-Avon Bats SAC. These core areas extend to 4 km for greater horseshoe bat and 2 km for lesser horseshoe bat. The DCO Scheme is c.24 km from the SAC and therefore no LSE.	No

Table 7.1: Screening Assessment

European Site	Qualifying Features	Potential effects	Baseline	Screening Rationale	Further consideration?
Mells Valley SAC	*Annex I habitats:* Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) Caves not open to the public *Annex II species:* Greater horseshoe bat *Rhinolophus ferrumequinum*	No potential effects on qualifying habitats. Potential effects on greater horseshoe bat. Severance of commuting routes (e.g. via direct habitat loss or lighting). Loss of foraging habitat. Loss or damage to roosts (during construction). Killing and injury (during construction via impacts on roosts or during operation via collision risk during operation). Disturbance of bats in tunnels due to increased frequency of train operation.	Bat activity surveys along the disused railway part of the DCO Scheme show that it is an important corridor for bats. Roosts of low numbers of lesser horseshoes have been identified within the DCO Scheme. Tunnels have been identified as being used by greater and lesser horseshoe bats.	The DCO Scheme site falls c.24 km from the SAC and is situated well outside the Bat Consultation Zones identified for the SAC, which extend up to 8 km for maternity roosts and 2.44 km for 'other' roosts (Mendip District Council, 2018). No LSE.	No

7.2 In-combination Assessment

7.2.1 The approach taken to identifying all projects and plans that could have in-combination effects with the DCO Scheme is described in the ES Chapter 18 (DCO Document Reference 6.21).

7.2.2 Those projects that are considered to have the potential for in-combination effects on European sites are discussed in Table 7.2 below (for locations see ES Volume 3 Figure 18.1, DCO Document Reference 6.24).

7.2.3 No projects or plans which would lead to habitat loss or habitat degradation in the Avon Gorge Woodlands SAC have been identified and thus there are no projects that are considered likely to have in-combination effects on this SAC.

7.2.4 No LSE in-combination for the Severn Estuary SAC/SPA and Ramsar have been identified.

7.2.5 A single Project has been identified with the potential for in-combination effects on the North Somerset and Mendip Bats SAC, where horseshoe bats may be impacted. This is the proposed development at Court House Farm by Bristol Port Company.

Table 7.2: Projects and Plans with Possible In-Combination Effects on European Sites

Project, Location and Timing	Description	Possible In-Combination Effects	Further Consideration?
DCO National Grid Hinkley Point C Connection Project According to the ES, construction was expected to take place between 2018 and 2024. In summer 2019 National Grid was undertaking advanced works such as capture and relocation of reptiles and or amphibians.	Application by National Grid to construct, operate and maintain a new 400,000 volt connection between Bridgwater, Somerset and Seabank Substation, north of Avonmouth together with a range of related modifications to the electricity transmission and distribution networks. The Option B route passes through Royal Portbury Dock to the north eastern edge of Portishead through the Drove Rhyne and adjacent fields of the Site of Nature Conservation Interest (SNCI), also known as Portbury Wharf Nature Reserve north of the disused railway. It then runs south and crosses the disused railway line between Portishead and Portbury where Sheepway also crosses the line. After this it crosses fields north of Upper Caswell Farm SNCI. The existing 132,000 volt overhead lines on the north-eastern edge of Portishead will be removed and new 132,000 volt underground cables will be laid down in their place. A small section of new 132,000 overhead line will also be installed in the same area, along with minor modifications to Portishead substation. Electric overhead lines from Seabank substation (north of Avonmouth) continue past Pill, Royal Portbury Dock, Portbury, Portishead and on to Bridgwater.	The proposed alignment for the Hinkley C Connection Project crosses the proposed rail alignment for the Portishead Branch Line DCO Scheme. Possible in-combination effects could occur as a result of disturbance to Severn Estuary SPA/Ramsar qualifying bird species and disruption of commuting habitat for horseshoe bats that could form part of the North Somerset and Mendip Bats SAC qualifying populations. The Hinkley C Connection Project HRA predicted no LSE for the Severn Estuary SAC where it over sailed at the River Avon crossing as the Applicant has committed to avoid encroachment onto the intertidal saltmarsh and mudflat habitats. The Project HRA report notes that there are no significant disturbance or displacement impacts predicted as a result of the Hinkley Connection Project, on bird species for which the Severn Estuary SPA and Ramsar are designated as these species occur in very low numbers in the potential zone of disturbance. Therefore, it is predicted that there will be no significant interaction between the Project and other projects. National Grid has committed in the DCO to mitigation measures which will avoid adverse	No

Table 7.2: Projects and Plans with Possible In-Combination Effects on European Sites

Project, Location and Timing	Description	Possible In-Combination Effects	Further Consideration?
		effects on integrity on bat qualifying features of SACs.	
Local planning application 16/P/1987/F Royal Portbury Docks Cargo storage area with hardstanding, lighting and ecological mitigation and new bridge over the railway line with access off Royal Portbury Dock Road. Planning permission granted on 21/12/16. No EIA required but the planning application was accompanied by environmental reports, including an ecological report and lighting study to predict the impacts on bats. The cargo storage area has been built and is in operation. The existing access is via an at grade crossing over the railway. The bridge must be built prior to construction of the Portishead Branch Line.	The development of the site for cargo storage, currently vehicles, and associated infrastructure has been completed, apart from the construction of a bridge. However, survey data for the DCO Scheme were obtained before completion of construction and therefore this proposed development still needs to be assessed as part of the in-combination assessment. The development retained the existing mature poplar trees and a new hedgerow was planted between the development and the disused railway line. The development has a sensitive lighting strategy and lux levels along the railway corridor were designed to average <0.5 lux during the operation of the development and should improve or at a minimum equal current pre-development light levels.	No in-combination effects on Severn Estuary SAC habitats or SPA / Ramsar qualifying bird species are anticipated as this location is over 1.2 km from the European site and provides sub-optimal terrestrial habitat for wintering birds. There is a potential for in-combination effects on horseshoe bats which form part of the North Somerset and Mendip Bats SAC qualifying population. The Portishead Branch Line DCO Scheme will result in further vegetation removal along the railway corridor, and the cargo storage project also resulted in loss of habitat due to the conversion of open fields to hardstanding. Movement of bats along the railway line may also be restricted by the planned bridge as well as lighting from the hardstanding areas for storage of cargo.	Yes, in respect of North Somerset and Mendip Bats SAC.
Avonmouth/Severnside Enterprise Area ("ASEA") Ecology Mitigation and Flood Defence Project Located approximately 0.72 km north of the DCO Scheme and on the north side of the River Avon. Major Application. Application received 29/05/18, validated 07/06/18. Planning	Works will include: • Raising existing flood bank defences and coastal sea wall defences; • New flood defences in some areas; • Modifications to outfalls for some major watercourses; and	Potential for in-combination effects on Severn Estuary SPA/Ramsar bird qualifying species from disturbance and habitat loss. The ASEA project will create a minimum of 80 ha of mitigation habitat for birds. This mitigation has been determined through the HRA process and is deemed to meet the requirements	No

Table 7.2: Projects and Plans with Possible In-Combination Effects on European Sites

Project, Location and Timing	Description	Possible In-Combination Effects	Further Consideration?
permission granted (subject to condition(s)) 31/05/19. This scheme is located northwest of Bristol, adjacent to the Severn Estuary and between the mouth of the River Avon and Aust cliffs.	• Minimum 80 ha of habitat creation as ecological mitigation, including wet grassland and open water. Works will be phased. Construction is expected to begin in 2020. The final components are to be constructed from 2030 onwards, as they will not be required until closer to the currently agreed design event of "1 in 200 year event at 2076". These final components are not being considered as part of the works for the project.	relating to loss of bird feeding habitat as a result of the scheme. The disturbance effects of the Portishead Branch Line DCO Scheme on SPA/Ramsar qualifying species are considered to be small and given the projects are >700 m apart from each other (at their nearest point), in-combination disturbance effects are considered unlikely.	
18/P/4072/EA1 NSDC Request for a formal screening opinion as to whether an EIA is required to be submitted for a mixed-use development. Land to North of A369 Martcombe Road Easton-in-Gordano Application validated 17/08/2018. Not decided – Screening Opinion not yet given.	The proposal comprises up to 1000 dwellings, employment space, a Local Centre, a primary school and public open space on the south side of Pill and the railway. Proposed height of buildings is up to 3 storeys. Vehicular access will be from A369 Martcombe Road. Pedestrian and cycling connections proposed into Pill.	The EIA Screening Report for the development details ecological mitigation measures such as licences for any protected species on site, a Construction Environmental Management Plan ("CEMP") to manage construction impacts, retention of species rich hedgerows and a buffer between the development and ancient woodland on the boundary. In-combination effects are therefore considered unlikely.	No
West of England Joint Spatial Plan and Joint Transport Study - Draft Strategy was submitted to the SoS for review on 13/04/18.	Draft Strategy includes proposal for future improvements such as new junction on the M5, 'Smart Motorway' management, increased rail capacity, improvements and bypasses on the A38 and A368/A371 and a mass transit link between Bristol City Centre and Bristol International Airport. The A38 improvements will depend on the future growth of the airport. It also identifies the potential	Superseded by JLTP4 (below).	N/A

Table 7.2: Projects and Plans with Possible In-Combination Effects on European Sites

Project, Location and Timing	Description	Possible In-Combination Effects	Further Consideration?
	for a light rail (tram) or heavy rail link from Bristol City Centre to the airport.		
Draft Joint Local Transport Plan "JLTP"4	The Draft JLTP4 provides a long list of transport schemes for the sub region. The only scheme in the vicinity of the DCO Scheme is proposed improvements to the M5 Junction 19.	Improvements to the M5 Junction 19 would aim to reduce congestion during peak hours, thereby improving traffic flows on the M5, into the Royal Portbury Dock, along the A369 Portbury Hundred between Portishead and Junction 19, and along the A369 past Pill towards Bristol. This is a small scale development in a location already affected by road traffic, noise, and night-time lighting. The redevelopment of Court House Farm as a cargo area for the port separates the M5 Junction 19 from the DCO Scheme. In-combination effects are considered unlikely	No

7.3 Screening Summary

7.3.1 The Screening Matrices in Annex D summarise the mechanisms by which LSE on European sites may occur.

European Sites Screened Out

Severn Estuary SAC/SPA/Ramsar

7.3.2 The potential for effects via pollution run-off was considered for SAC and Ramsar qualifying habitats. At Pill where the DCO Scheme is closest to SAC/Ramsar qualifying habitat (Atlantic Salt Meadows), no hydrological connectivity is present between the DCO Scheme and the SAC qualifying habitat. For other qualifying habitats, which are further away from the DCO Scheme and which are estuarine or covered by seawater part or all of the time, no LSE are assessed, in the unlikely event of any pollution incident, due to distance and the lack of hydrological linkages.

7.3.3 The potential for effects on SPA/Ramsar qualifying bird species have been considered at two main locations on the disused line section of the DCO Scheme: at Pill, where the Portbury Freight line is 80 m from the designated site; and in the vicinity of Portbury Wharf Nature Reserve, which could support SPA/Ramsar qualifying species and thus provide a functional link between the DCO Scheme and the designated sites. At Pill, the only SPA-qualifying species recorded was a low number of redshank and no significant disturbance is predicted.

7.3.4 At Portbury Wharf Nature Reserve, the SPA and Ramsar qualifying bird species predominantly occupy the northern part of the reserve which is approximately 600 m north of the DCO Scheme and no impacts are predicted.

7.3.5 No in-combination effects are predicted as the numbers of qualifying species in the areas that could be affected are so low.

Wye Valley Woodlands, Wye Valley and Forest of Dean Bat Sites SAC, Mendip Limestone Grasslands SAC, Bath and Bradford-on-Avon Bats SAC and Mells Valley SAC

7.3.6 Both greater and lesser horseshoe bats have been recorded within the DCO Scheme. There are no Bechstein's bat records within the DCO Scheme and therefore no potential for impacts on this species as a qualifying feature of Bath and Bradford-on-Avon Bats SAC.

7.3.7 Lesser horseshoe bats from Wye Valley Woodlands SAC and Wye Valley and Forest of Dean Bat Sites SAC are unlikely to travel as far as the DCO Scheme. The DCO Scheme is also outside of the daily foraging/commuting range and on the other side of the Severn Estuary for greater horseshoe bats.

7.3.8 The Mendip Limestone Grasslands SAC, Bath and Bradford-on-Avon Bats SAC and Mells Valley SAC, all include either greater or lesser horseshoe bats or both as qualifying species. However, these three SACs are over 20 km from the DCO Scheme area and planning guidance, provided by Mendip Council (2018) and Wiltshire Council

(2015), advises that at these distances effects on SAC bats are unlikely to occur, therefore these sites are screened for further assessment.

European Sites Screened In

7.3.9 The following European sites are taken forward to Stage 2, Appropriate Assessment:

- Avon Gorge Woodlands SAC, and
- North Somerset and Mendip Bats SAC (bat qualifying features only).

SECTION 8

Stage 2 Appropriate Assessment: Effects on Integrity

8.1 Introduction

8.1.1 This section of the report focusses on Stage 2 of the HRA process and considers whether LSE identified at Stage 1 (Screening), will adversely affect the integrity of the sites in view of their Conservation Objectives. This stage of the assessment has taken into account preventative measures intended to avoid or reduce harmful effects of the DCO Scheme that are known to be effective. No account is taken of compensatory measures and preventative measures where the expected benefits of the measures are not certain at the time of this assessment.

8.2 European Sites

8.2.1 The qualifying features, Conservation Objectives and conservation status of the European sites considered in this stage of the assessment are outlined below.

Avon Gorge Woodlands SAC

8.2.2 The Avon Gorge Woodlands SAC is located south west of Bristol (OSGR ST560741). The SAC covers an area of 151 ha. The Avon Gorge rises c.100 m either side of the River Avon and comprises natural cliffs, quarries and scree of Carboniferous limestone with grassland and woodland on shallower slopes. The site is important because of the small leaved lime *Tilia cordata* woodland, the associated species rich transitions to scrub and herb rich calcareous grasslands. The open limestone grassland and cliff ledges support a high number of uncommon species, including rare whitebeams *Sorbus* spp., with two unique to the Avon Gorge, *S. bristoliensis* and *S. wilmottiana*, and other important plants, such as Bristol rock-cress *Arabis scabra* and honewort *Trinia glauca*. Small groves of yew *Taxus baccata* also occur on some of the stonier situations.

8.2.3 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:

- *Tilio-Acerion* forests of slopes, screes and ravines (mixed woodland on base-rich soil associated with rocky slopes) *Priority habitat; and
- semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (dry grasslands and scrublands on chalk or limestone).

8.2.4 The estimated extents of the woodland and grassland qualifying features within the SAC are 105.75 and 6.93 ha respectively (Natural England, 2019).

8.2.5 With regard to the SAC and the natural habitats and/or species for which the site has been designated, and subject to natural change the Conservation Objectives for the SAC are as follows[11]:

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

- the extent and distribution of qualifying natural habitats;
- the structure and function (including typical species) of qualifying natural habitats; and
- the supporting processes on which qualifying natural habitats rely."

8.2.6 Recently-published supplementary guidance (Natural England, 2019) sets out the ecological attributes that best describe site integrity and states that the safeguarding of these attributes will enable the achievement of the Conservation Objectives. These attributes and targets are summarised in Table 8.1.

Table 8.1 Summary of attributes

Conservation Objective	Attribute	Targets
***Tilio-Acerion* forests of slopes, screes and ravines (mixed woodland on base-rich soil associated with rocky slopes)**		
Extent and distribution	Extent of the feature within the site	Maintain or restore the total extent to 105.75 ha
	Spatial distribution of the feature within the site	Maintain or restore the distribution and configuration of the feature across the site.
Structure and function	Vegetation Community Composition	Ensure the component vegetation communities are referrable to and characterised by the National Vegetation Classification ("NVC") communities W7, W8 and W10.
	Vegetation structure – canopy cover	Maintain an appropriate tree canopy cover across the feature.
	Vegetation structure – open space	Maintain or restore areas of permanent / temporary open space (approximately 10% of area)

[11] http://publications.naturalengland.org.uk/publication/6740736611450880 - accessed 28.11.18

Table 8.1 Summary of attributes

Conservation Objective	Attribute	Targets
	Vegetation structure – old growth	Maintain the extent and continuity of undisturbed mature stands
	Vegetation structure – dead wood	Maintain or restore the continuity and abundance of standing or fallen dead or decaying wood
	Vegetation structure – age class distribution	Maintain or restore at least three age classes of the commonest trees
	Vegetation structure – shrub layer	Maintain or restore an understorey of shrubs.
	Vegetation structure – woodland edge	Maintain or restore a graduated woodland edge into adjacent semi-natural open habits, other woodland / wood-pasture types of scrub.
	Adaption and resilience	Maintain or restore the resilience of the feature by ensuring a diversity of site-native trees.
	Browsing and grazing by herbivores	Maintain browsing at a low level that allows well developed understorey and lush ground vegetation with some grazing sensitive species evident and tree seedings and sapling common in gaps.
	Regeneration potential	Maintain or restore the potential for sufficient natural regeneration of desirable trees and shrubs,
	Key structural, influential and/or distinctive species	Maintain or restore the abundance of the following typical species: Small-leaved lime – *Tilia cordata*; whitebeam spp. – *Sorbus spp*.; Soft Shield-fern - *Polystichum setiferum*; Hart's-tongue - *Asplenium scolopendrium*.
	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature.
	Soils, substrate and nutrient cycling	Maintain or restore the properties of the underling soil types to within typical values for the habitat.

Table 8.1 Summary of attributes

Conservation Objective	Attribute	Targets
Supporting processes	Functional connectivity with the wider landscape	Maintain or restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site.
	Air quality	Restore the concentrations and depositions of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS (www.apis.ac.uk)
	Hydrology	Maintain or restore natural hydrological processes to provide the conditions necessary to sustain the feature within the site.
	Illumination	Ensure artificial light is maintained to a level which is unlikely to affect natural phenological cycles and processes to the detriment of the feature and its typical species at this site.
Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone		
Extent and distribution	Extent of the feature within the site	Maintain or restore the total extent to 6.93 ha.
	Spatial distribution	Maintain or restore the distribution and configuration of the feature across the site.
Structure and function	Vegetation Community Composition	Ensure the component vegetation communities are referrable to and characterised by the NVC communities CG1 and CG3.
	Vegetation: proportion of herbs	Maintain or restore the proportion of herbaceous species.
	Key structural, influential and/or distinctive species	Maintain or restore the abundance of the following typical species: the constant and preferential plants of the CG1 and CG3 grassland NVC community types which forms a key component of the H6210 feature.

Table 8.1 Summary of attributes

Conservation Objective	Attribute	Targets
	Vegetation: undesirable species	Maintain or restore the frequency/cover of undesirable species to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread.
	Vegetation community transitions	Maintain or restore the pattern of natural vegetation zonations / transitions.
	Soils, substrate and nutrient cycling	Maintain or restore the properties of the underlying soil types to within typical values for the habitat.
	Supporting off-site habitat	Maintain or restore the extent, quality and spatial configuration of land or habitat surrounding or adjacent to the site which is known to support the feature.
	Functional connectivity with wider landscape	Maintain or restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site.
	Adaptation and resilience	Maintain or restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.
Supporting processes	Air quality	Maintain or restore the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS (www.apis.ac.uk).
	Conservation measures	Maintain or restore the management measures which are necessary to maintain or restore the structure, functions and supporting processes associated with the feature.

8.2.7 The Site Improvement Plan for the SAC[12] identifies the following priority issues in respect of the qualifying features of the site;

- invasive species (woodland and grassland);
- under grazing (grassland);
- public access (woodland and grassland);
- disease (woodland);
- changes in species distributions (woodland and grassland); and
- air pollution (woodland and grassland).

8.2.8 The SAC has a single component SSSI, the Avon Gorge SSSI which covers the same extent as the SAC. Overall 47% of the SSSI is in 'Favourable condition' and 53% is in 'Unfavourable -recovering' condition[13]. The DCO Scheme falls within Units 2, 6, 7, 8, 9 and 10 of the SSSI. Of these six units, four are in 'Unfavourable – recovering' condition; and two, Units 6 and 9 are in 'Favourable condition'. The main reason for the 'Unfavourable – recovering' condition is scrub encroachment of grassland and presence of non-natives, such as *Cotoneaster spp*., sycamore *Acer pseudoplatanus*, *Buddleja spp*., holm oak *Quercus ilex* and *Rhododendron spp.* in woodland.

North Somerset and Mendip Bats SAC (bat qualifying features only)

8.2.9 The North Somerset and Mendip Bats SAC is a multi-site SAC located in the South West of England. The SAC covers 561 ha and is comprised of seven component SSSIs of which the Brockley Hall Stables SSSI is the closest to the DCO Scheme at 9 km to the south.

8.2.10 The limestone caves and mines of the Mendips and the north Somerset hills provide a range of important breeding and hibernation sites for lesser horseshoe bat and greater horseshoe bat.

8.2.11 With regard to the SAC species for which the site has been designated (i.e. lesser and greater horseshoe bat) and subject to natural change, the Conservation Objectives for the SAC are as follows[14]:

"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;

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[12] http://publications.naturalengland.org.uk/publication/5021516609617920 - accessed 28.11.18

[13] https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1003073&SiteName=Avon%20Gorge&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= - accessed 28.11.18

[14] http://publications.naturalengland.org.uk/publication/6252034999189504 - accessed 28.11.18

- the extent and distribution of qualifying natural habitats and habitats of qualifying species;
- 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."

8.2.12 The Site Improvement Plan for the SAC[15] identifies the follow priority issues in respect of the qualifying bat features of the site;

- planning permission (i.e. impacts of development);
- change to site conditions (relevant to mine stability);
- disease (ash dieback and its effect on woodland habitat); and
- air pollution (altering habitats in the SAC used by bats).

8.2.13 The SAC is comprised of seven SSSIs: Banwell Caves SSSI; Banwell Ochre Caves SSSI; Brockley Halls Stables SSSI; Compton Martin Ochre Mine; Kings Wood and Urchin Wood SSSI; the Cheddar Complex SSSI; and the Wookey Hole SSSI. A summary of the condition of these sites in respect to bats is provided below in Table 8.2.

8.2.14 The Brockley Halls Stables SSSI, to which two greater horseshoe bats have been tracked from the DCO Scheme, comprises part of the former stable block of Brockley Hall and its immediate environs. The roof void of this building is used as a summer breeding roost by a substantial colony of greater horseshoe bats. This is the closest of the SAC component SSSIs to the DCO Scheme. All the other component SSSIs are more than 11 km from the DCO Scheme.

Table 8.2 Summary of condition assessment data for SSSI components of the North Somerset and Mendip Bats SAC

SSSI name	Distance from the DCO Scheme (km)	Condition assessment
Brockley Halls Stables	9 km	Favourable for bats
Banwell Caves	20 km	Favourable for bats
Banwell Ochre Caves	18.5 km	Favourable for bats
Compton Martin Ochre Mine	14 km	Favourable for bats
King's Wood and Urchin Wood	11 km	Favourable for bats

[15] http://publications.naturalengland.org.uk/publication/6226153064890368 - accessed 28.11.18

Table 8.2 Summary of condition assessment data for SSSI components of the North Somerset and Mendip Bats SAC

SSSI name	Distance from the DCO Scheme (km)	Condition assessment
The Cheddar Complex	17 km	Important site for greater horseshoe bat – not mentioned in condition assessment
Wookey Hole	22 km	Favourable for bats

8.3 Potential Impacts

8.3.1 The potential impacts of the DCO Scheme for which LSEs have been identified for European sites are outlined below.

Avon Gorge Woodlands SAC

8.3.2 The DCO Scheme has potential direct impacts on the Avon Gorge Woodlands SAC during both construction and operation.

Construction

8.3.3 Construction works, including installation of new fencing, access steps, a signal and minor works to eight structures is required within the SAC. Unmitigated site clearance and construction adjacent to these features have the potential to cause the following:

- Direct habitat loss of SAC qualifying habitats, with implications for the conservation objective of maintaining or restoring extent and distribution of the qualifying feature.
- Habitat degradation due to the risk of invasive species and pathogen transfer, as machinery and materials move across the site, with implications for the conservation objective of maintaining or restoring structure and function of the qualifying feature.
- Habitat degradation via incursions and accidental spillages of pollutants into qualifying habitat from site personnel, machinery and storage of materials and equipment, with implications for the conservation objective of maintaining or restoring structure and function of the qualifying feature.

Habitat loss

8.3.4 Figure 2 in Annex A indicates the overlap of the DCO Scheme with the qualifying features of the Avon Gorge Woodlands SAC. Figure 3 in Annex A illustrates more detail of predicted habitat loss due to infrastructure such as fencing, structures and steps. NR has confirmed that the following is required for vegetation clearance for construction activities:

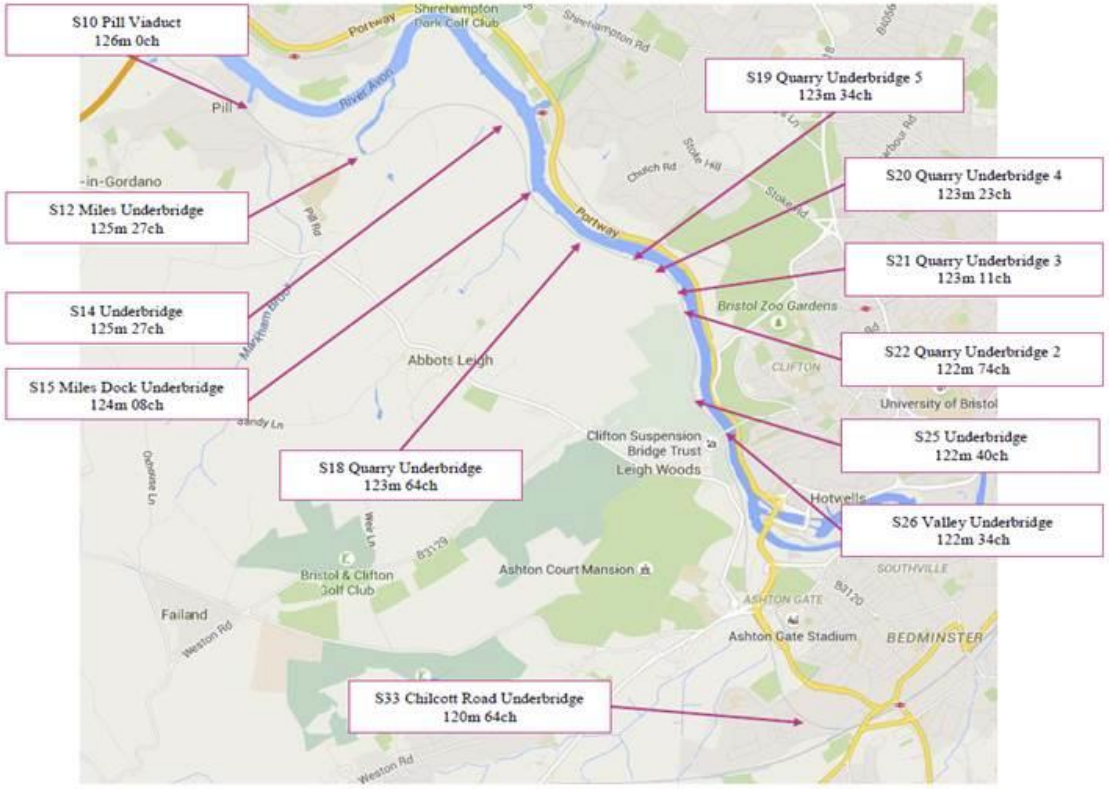
- 1 m either side of fences and access steps.
- 1 m either side of wing walls and 5 m from bridges where work is proposed (seven bridges reference numbers S15, S18, S19, S20, S21, S25 and S26 – see Figure 8.1 below).
- Quarry Bridge No. 2 (reference number S22, Figure 8.1) – 5 m around the structure either side along the rail and along the embankment.
- Quarry Bridge No. 2 site compound. A temporary ramp from the freight line to Quarry 2 with an associated site compound area is proposed for the construction works to Quarry Bridge No. 2. The methodology for the bridge replacement and location of the site compound is included in ES Appendix 9.11 AGVMP Ver. 02 Annex C (DCO Document Reference 8.12).

8.3.5 Vegetation clearance of 1 m will be required around each telecommunications mast and equipment box. Two repeater antennae mounted on a pole at the south end of Clifton Bridge No. 2 Tunnel and about 500 m from the Clifton Suspension Bridge, with one antenna mounted at 8 m facing up the railway towards Clifton Bridge No. 1 Tunnel and the other mounted at 5 m pointing north into Clifton Bridge No. 2 Tunnel. Two repeater back to back antennae attached at 5 m to Sandstone Tunnel East (south) portal.

- Local rebuild of retaining walls at 122mi 67ch and at 122mi 79ch.
- Local rebuild of Retaining Walls at 122mi 67ch and at 122mi 79ch. Vegetation clearance on 2 m of wall to rebuild and 2 m either side of wall plus 2 m either side to tie-in (10 m in total at each retaining wall).
- No vegetation clearance is required for the minor earthworks retaining structures.

8.3.6 In addition to this, vegetation removal is required for geotechnical works on NR owned rock faces and third party rock faces to avoid rock falls affecting the railway by interventions such as installation of rock bolts or rock catch fences. The detailed design for the interventions has not been completed at the current time and the exact locations of the interventions yet to be determined. To undertake an assessment of vegetation losses and impacts, realistic worse-case scenarios have been developed.

8.3.7 NR proposes five ‘micro’ construction compounds within the Avon Gorge and have confirmed that these will be placed in areas where no vegetation clearance is required e.g. near bridges or if vegetation clearance is necessary, the locations will be where only low value vegetation such as bramble is present.



Structures within the Avon Gorge SAC/SSSI are S15, S18, S19, S20, S21, S22, S25 and S26

Figure 8.1: Location of structures requiring repairs

8.3.8 The areas of vegetation to be removed for construction activities have been calculated for fencing, access steps, structures, the signal and signal locator box, telecommunications masts and equipment boxes and retaining walls.

8.3.9 A preliminary design has been produced for a site compound area for construction works to Quarry Bridge No. 2 and an associated ramp to allow access from the freight line to the site compound area (see ES Appendix 9.11 AGVMP Ver. 02, Annex C, DCO Document Reference 8.12). The ramp and compound area are within the former quarry site on land owned by the National Trust (Quarry 2). Removal of grassland, scrub and woodland has been calculated from the preliminary design.

8.3.10 A realistic worse-case scenario has been assessed to determine the potential impact of geo-technical works on NR rock faces (the methodology for this is explained in ES Appendix 9.11 AGVMP Ver. 02, Annex D, DCO Document Reference 8.12). Eleven of the 14 rock faces potentially require installation of rock bolts. The locations of the rock faces are shown on Figure 2 of this HRA and ES Appendix 9.11 AGVMP Ver. 02, Annex F, Figure 2 (DCO Document Reference 8.12).

8.3.11 A worse-case scenario has been assessed to determine the maximum potential impact of geo-technical works on third party rock faces higher up in the gorge that are owned by the National Trust, the FC and the Wills Estate. The methodology for this is explained in ES Appendix 9.11 AGVMP Ver. 02, Annex E (DCO Document Reference 8.12). Two of the eleven rock faces potentially require installation of rock bolts and

three require a rock catch fence to the foot of the slope. The locations of the rock faces are shown on ES Appendix 9.11 AGVMP Ver. 02, Annex F, Figure 3 (DCO Document Reference 8.12).

8.3.12 Table 8.3 shows the total area of vegetation to be removed for each qualifying feature as a result of the construction related activities. Both semi-natural ancient woodland and secondary (recent) woodland constitute the qualifying feature of *Tilio-Acerion* woodland, but the table separates the estimated losses for the two woodland types.

8.3.13 The total approximate area of land under management of NR running through the SAC is 11.5 ha. The vegetation clearance illustrated in Table 8.3 is 7,864 m^2 in total (0.79 ha), which equates to approximately 6.9% of NR land and 0.52% of the total area within the SAC (which is 151 ha).

8.3.14 In respect of the Avon Gorge Woodlands SAC;

- loss of 0.06 ha of qualifying grassland equates to a loss of 0.84% of the SAC total (6.93 ha) for this habitat; and
- loss of 0.73 ha of qualifying woodland (both semi-natural ancient and secondary or recent woodland) equates to a loss of 0.69% of the SAC total (105.75 ha) for this habitat.

8.3.15 Of the woodland loss, approximately 45% of this would be of secondary or recent woodland and 55% semi-natural ancient woodland.

Table 8.3: Areas of vegetation clearance within the Avon Gorge Woodlands SAC by habitat type

	SAC qualifying habitats		
Construction Activity	**Semi-natural ancient woodland (m^2)**	**Secondary (recent) woodland (m^2)**	**Grassland (m^2)**
Fences removed/replaced or proposed and new access steps	2494	2225	76
Works to bridges number S15, S18, S19, S20, S21, S25 and S26	162	606	
Works to Quarry Bridge No. 2 (S22)	50	43	
Signal BL1899	1		
Equipment Cabinet for Signal BL1899		6	
Telecommunications masts and associated equipment boxes	25		15
Quarry Bridge No. 2 site compound (within National Trust owned former quarry).	106		381
Geo-technical works on NR owned rock faces. Assumed areas.	296		80
Geo-technical works on third party owned rock faces. Assumed areas.	868	390	20
Local rebuild of Retaining Walls		10	10
Total	***4002***	***3280***	***582***

Whitebeams

8.3.16 Whitebeam species, some of which are endemic to the Avon Gorge, are key species in the *Tilio-Acerion* forest qualifying feature, as influential and distinctive species that are recognised as an attribute contributing to the structure and function of the habitat (NE, 2019). The Avon Gorge has a diverse population of whitebeams, with 21 taxa recorded and on-going speciation (Rich & Houston 2004; Houston et al. 2008, Rich et al. 2009; Rich et al. 2010). Surveys in 2015-2016 (see Annex C of this HRA and ES Appendix 9.10, DCO Document Reference 6.25) have shown that 11 whitebeam species are present on NR land, some of which are very rare.

8.3.17 As part of the project a detailed topographic survey was completed to plot the exact positions of the rare whitebeams on NR land in conjunction with national whitebeam experts. The impacts on rare

whitebeam species within the SAC are anticipated to be as shown in Table 8.4. The reason for tree removal is given in the table. An additional one tree per species has been included as contingency in case of slight changes at detailed design and construction tolerances, therefore the assessment of tree loss takes a precautionary approach. The number and species to be removed on NR and third-party rock faces has been assumed and can be considered as a conservative worst-case scenario. The exact location of the geotechnical works will be subject to detailed design, which will aim to avoid impacts on rare trees and ground flora but impacts cannot be ruled out at the current design stage.

8.3.18 Table 8.4 details the whitebeam losses assumed for the purposes of this HRA Report to arise as a result of the DCO Scheme. The total number of rare whitebeam trees to be coppiced or removed is estimated to be 27. The following bullets summarise the losses of rare whitebeam species:

- Twelve Avon whitebeam, ten of which require removal and two coppiced, of the c 42 known individuals of this rare endemic (International Union for Conservation of Nature ("IUCN") 'Critically Endangered'), which is 29% of the world and SAC population.
- One Wilmott's whitebeam, a rare endemic (IUCN 'Endangered') of the 97 world/SAC population and 10 individuals recorded in the survey area (NR land). The loss due to the DCO Scheme is approximately 1% of the world/SAC population and 10% of the survey population.
- Six Leigh woods whitebeam. There are approximately 300 individuals (world/SAC population) and 184 in the survey area (NR land) and this will impact 2% of the SAC population and 3% of the survey population.
- One Grey-leaved whitebeam as a contingency. The total world population is 500 and the Avon Gorge SAC population is approximately 50-60. The loss due to the DCO Scheme is approximately 0.2% of the world population and 2% of the Avon Gorge SAC population.
- Five round-leaved whitebeam, four removed and one coppiced. The total world population is c. 800 trees (no systematic survey data available) and 414 were recorded in the flora survey of NR land (and 33 have been removed by persons unknown since). The loss due to the DCO Scheme is approximately 0.6% of the world population and approximately 1% of the survey population.
- Two Bristol whitebeam, one coppiced and one contingency. This is 0.7% of the world/SAC population of 300 individuals and 5% of the 37 trees identified in the survey area (NR land).

Table 8.4: Removal/coppice of rare whitebeam trees for DCO Scheme

Species and number	Reference number (Appendix 9.11, Annex F, Figure 1)	Location	Removal or coppice	Description of tree (Houston 2017)	Reason for removal
1 Avon whitebeam	AV04	Clifton Bridge Tunnel 1 portal	Remove and stumps treated with herbicide	Coppiced, height 4m, girth 7cm, 4 stems	Dangerously overhanging
1 Avon whitebeam	AV03	Clifton Bridge Tunnel 1 portal	Remove and stumps treated with herbicide	Coppiced, height 4.5m, 3 stems	Dangerously overhanging
1 Avon whitebeam	AV05	Clifton Bridge Tunnel 1 portal	Remove and stumps treated with herbicide	Coppiced, height 6m, girth 20cm, 2 stems	Dangerously overhanging
1 Avon whitebeam	AV07	Clifton Bridge Tunnel 1 portal	Coppice	Coppiced, height 2.5m, multi-stem	Overhanging rock face
1 Avon whitebeam	AV022	Clifton Bridge Tunnel 1 portal	Coppice	Maiden, height 11m, girth 38cm	Overhanging rock face
1 Avon whitebeam	Predicted	NR rock face ID03	Remove	Unknown	Predicted for installation of rock bolts
1 Avon whitebeam	Predicted	NR rock face ID04	Remove	Unknown	Predicted for installation of rock bolts
4 Avon whitebeam	Predicted	Third party rock face 2	Remove	Unknown	Predicted for installation of rock catch fence
1 Avon whitebeam	Predicted		Remove	Unknown	Contingency
1 Round-leaved whitebeam	EMI10	Clifton Bridge Tunnel 2 eastern portal	Remove and stumps treated with herbicide	Coppiced, height 3m, 2 stem	Dangerously overhanging
1 Round-leaved whitebeam	EMI182	Bridge No. 6	Remove	Coppiced, height 2m, girth 3.5cm, 2 stems	To enable bridge works

Table 8.4: Removal/coppice of rare whitebeam trees for DCO Scheme

Species and number	Reference number (Appendix 9.11, Annex F, Figure 1)	Location	Removal or coppice	Description of tree (Houston 2017)	Reason for removal
				from 15cm stump. Long known tree	
1 Round-leaved whitebeam	EMI08	Near Valley Bridge	Coppice	Coppiced, height 0.32m, 4 stems	For installation of new fencing
1 Round-leaved whitebeam	Predicted	NR rock face ID05	Remove	Unknown	Predicted for installation of rock bolts
1 Round-leaved whitebeam	Predicted		Remove	Unknown	Contingency
1 Bristol whitebeam	BRI08	Clifton Bridge Tunnel 2 portal	Coppice	Maiden, height 4m, girth 27cm, long known stunted mature tree	Overhanging rock face
1 Bristol whitebeam	Predicted		Remove	Unknown	Contingency
5 Leigh Woods whitebeam	Predicted	NR rock face ID09	Remove	Unknown	Predicted for installation of rock bolts
1 Leigh Woods whitebeam	Predicted		Remove	Unknown	Contingency
1 Willmot's whitebeam	Predicted	NR rock face ID07	Remove	Unknown	Predicted for installation of rock bolts
1 Grey-leaved whitebeam	Predicted		Remove	Unknown	Contingency

Habitat degradation

8.3.19 During construction works inadvertent incursion into qualifying habitats and any accidental spillages of pollutants could degrade qualifying habitats.

8.3.20 Construction works could facilitate the spread of non-native invasive species. These are a particular threat to the SAC qualifying habitats (see paragraph 8.2.7 of this report) and include non-natives, such as *Cotoneaster spp*., *Acer pseudoplatanus*, *Buddleja spp*., holm oak and *Rhododendron spp.* in woodland.

Operational impacts

Indirect habitat loss

8.3.21 During operation of the DCO Scheme, woodland habitat may be more susceptible to windthrow due to the removal of edge trees. There may also be some vegetation management required by NR e.g. to ensure the ballasted area and cess is maintained clear of all vegetation, to maintain drainage and to safeguard operation of the railway in respect of overhanging trees (see the NR SMS ES Appendix 9.15, DCO Document Reference 6.25). However, the total extent of clearance would be no greater than that already cleared at the construction phase.

8.3.22 Rock-faces supporting grassland habitat will require operational maintenance under a watching brief and with NE permission. However, the maximum extent of clearance has been assessed for the construction phase and therefore no further loss of grassland habitat is anticipated during operation.

North Somerset and Mendip Bats SAC

8.3.23 The DCO Scheme lies within, but at the outer extent of, Zones B and C of the North Somerset 'Bat Consultation Zone' (The North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document, North Somerset Council, 2018), where bands A, B, C reflect the likely importance of the habitat for bats and proximity to maternity and other roosts. Guidance states that "*within the Bat Consultation Zone, where SAC bats could be adversely affected by development appropriate mitigation will be required*" (North Somerset Council, 2018).

8.3.24 There will be no direct impacts on the North Somerset and Mendip Bats SAC. The potential for impacts on the SAC bat population exists as individuals forming part of the SAC population(s) have been found to use the habitats within the DCO Scheme, and activities associated with the DCO Scheme could affect this usage through severance of commuting routes (e.g. via direct habitat loss or lighting). The LSE has been identified for the DCO Scheme alone and in-combination with the Royal Portbury Docks development at Court House Farm. Although this development is largely complete, the survey data for bats were obtained before the start of construction and therefore the in-combination effect is assessed as part of the HRA.

8.3.25 In terms of physical area, the SAC designation applies to a very small element of the habitat required by the SAC bat population (the maternity roosts and entrances to their hibernation sites) and the wider countryside supports SAC bat populations by providing a large enough area to provide the range of food sources and other roost sites required to support the whole population (North Somerset Council, 2018).

8.3.26 The Bat Consultation Zones identified for the SAC (North Somerset Council, 2018), illustrate the geographic area where SAC horseshoe bats may be found, with the three bands, A, B and C, reflecting the density at which horseshoe species may be found i.e. the density reduces with distance from the SAC. The DCO Scheme lies well outside (>8 km) key Juvenile Sustenance Zones (North Somerset Council, 2018) for the SAC (which extend to 1 km from maternity roosts) and well outside of key foraging areas identified in Band A, reducing the likely magnitude of any potential effects of the DCO Scheme on the SAC bat populations.

8.3.27 The disused railway line within the DCO Scheme provides a corridor for movement for the bat populations of the North Somerset and Mendip Bats SAC. Bats require linear features in the landscape to provide landscape permeability (North Somerset Council, 2018) and the SAC bats need to be able to move through the landscape between their roosts and their foraging areas in order to maintain 'Favourable Conservation Status'.

8.3.28 Habitat connectivity and the protection of habitats around male territories is also important for inter-colony gene flow (i.e. the transfer of genetic variation from one population to another) (Rossiter et. al., 2000). Greater and lesser horseshoe bats require linear features in the landscape to provide landscape permeability because these species require sheltered, vegetated flight lines for their echo-location navigation. The disused railway line provides habitat continuity for the SAC bat populations and the quality and structure of the habitats is important to the ecological functionality of the landscape feature as a navigational route and foraging resource.

8.3.29 Whilst a link between the SAC and the DCO Scheme site has been identified, not all of the greater and lesser horseshoe bats using the DCO Scheme site will be part of the SAC population and not all bats from the SAC will use the DCO Scheme site, which reduces the potential for adverse effects on the integrity of the SAC bat population. Potential impacts are discussed below.

Severance

8.3.30 Vegetation clearance of the linear corridor of trees and scrub along the currently disused line could disrupt navigational features in several areas that bats rely on for movement through the landscape.

8.3.31 Bats are sensitive to light and will avoid lit areas[16]. The interruption of a flyway by light disturbance would force the bat to find an alternative route which is likely to incur an additional energetic burden and will

[16] http://batsandlighting.co.uk/ - accessed 11.12.18

therefore be a threat to the viability of the bat population. In some circumstances, an alternative route is not available and this can lead to isolation and fragmentation of the bat population from key foraging areas and/or roosts. Horseshoe bats are known to be very light sensitive species (Stone, 2013) and are linked to habitat features. The North Somerset and Mendip Bats SAC Guidance on Development (North Somerset Council, 2018) recommends that light levels should be kept below 0.5 lux for existing or proposed habitat features utilised by horseshoe bats.

8.3.32 The potential for effects via severance of commuting routes is considered to exist along the disused railway section of the DCO Scheme specifically around Portbury Dock.

8.3.33 At Portbury Dock, vegetation removal would increase the permeability of light from adjacent sites on to the rail corridor, which may displace bats from flight lines, such as those that link under the M5. It is considered that lighting has the greatest potential impact on the disused line between Portbury Dock Road and Marsh Lane where Port facilities are on both sides of the disused line, including the recently developed Court House Farm site.

8.3.34 [Paragraph deleted from revised version].Mitigation measures in respect of potential severance impacts via vegetation clearance and lighting are outlined in Section 8.4.

In-combination effects

8.3.35 The potential for in-combination impacts on SAC bat populations has been identified via severance effects, at Court House Farm, Royal Portbury Docks (see Table 7.2) where works to develop the site for port related uses are being undertaken.

8.3.36 The construction phase of the Court House Farm development will not coincide with that of the DCO Scheme as construction is complete apart from a proposed bridge. Therefore, there should be no in-combination construction impacts.

8.3.37 There is a potential for in-combination effects on SAC horseshoe bats during operation of the DCO Scheme. The DCO Scheme will result in vegetation removal along the railway corridor and the Court House Farm project has resulted in loss of habitat due to the construction of the hardstanding and construction of a vehicle bridge. Bristol Port Company has planted a new hedgerow between their development site at Court House Farm to maintain a dark corridor. The potential for in-combination effects is because of increased lighting levels on the railway corridor. The lighting assessment[17] provided in support of the Court House Farm planning application predicted that the lux levels will average <0.5 lux along the railway corridor during the operation of the development and should improve or at a minimum equal current pre-development light levels. Lighting (lux) levels will be monitored post-

[17] https://planning.n-somerset.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=ZZZXGMLPJV163 – accessed 07.01.19

construction in accordance with a planning condition to ensure anticipated lux levels of <0.5 lux are met.

8.3.38 The measures of the DCO Scheme undertook a lighting survey along the disused railway corridor near Court House Farm in July 2019 to determine the lighting levels post construction of the new cargo area (but before the construction of the bridge). The results are shown in the Lighting Survey report (ES Appendix 9.17). The survey recorded existing light levels of between 0.01 and 0.5 lux at the centre of the disused line. Where vegetation had been cleared for a temporary road crossing between two of Bristol Port Company's sites for storage of vehicles and associated infrastructure to the north and south of the disused line, light levels were 24.9 lux to the north, 0.16 lux to the south and 0.23 lux at the centre of the disused line.

8.3.39 The results of the lighting survey indicate that existing lux levels along the centre of the disused railway corridor are at or below 0.5 lux. The report to inform discharge of Condition 9 – lighting details, Court House Farm, Bristol Port Company (The Landmark Practice, 2017) confirms that the at-grade crossing of the railway corridor will not be lit. Condition 9 of the planning consent requires that details of the type and location of the proposed lighting on the new railway bridge will also need to be submitted for approval before construction on the bridge is commenced.

8.3.40 The DCO Scheme will remove some of the existing vegetation between Portbury Dock Road Bridge and Marsh Lane along the disused line, where the Court House Farm development is situated to the south. The potential for in-combination effects are further considered in Section 8.5 considering the mitigation for the DCO Scheme outlined in Section 8.4.

8.4 Project Mitigation

8.4.1 The mitigation measures that form part of the DCO Scheme have been identified and assessed for the purposes of the EIA process in the ES. As a result of the rulings from the CJEU in 2018 a number of changes have been made to the way in which protective measures have been taken into account in this HRA Report.

8.4.2 As explained in Section 1.3, the approach to the HRA for the DCO Scheme changed after *People Over Wind and Peter Sweetman v Coillte Teoranta* Case C-323/17. Although protective measures form part of the DCO Scheme for the purposes of the process of EIA, for the HRA process no protective measures have been taken into account in determining whether the DCO Scheme, alone or in combination with any other project, will give rise to LSE on any European site.

8.4.3 As noted in Planning Inspectorate Note 5/2018, there is no authoritative definition of what constitutes an integrated or additional avoidance or reduction measure and this should be considered on a case by case basis. If a measure is being introduced to avoid or reduce an effect on a European site then it can be viewed as mitigation. At this stage of the HRA process a highly conservative approach is taken pending further consultation with NE. Protective measures taken into account in Stage

2 are those in which there is a high confidence that the measure will be effective in reducing or avoiding harm to the integrity of a European site. Where measures will deliver future benefits these are only taken into account if the benefits are certain of delivery. This means that measures commonly described as adaptive mitigation measures because they relate to the future management of a European site are now to be treated as compensatory measures.

8.4.4 The mitigation measures that are proposed as part of the DCO Scheme and are either embedded within the description of the scheme or are measures proposed to mitigate predicted LSE are found in a number of documents submitted with the DCO application. These include the following documents, with those details relevant to the HRA Report outlined in the subsequent sections of this document for each European site:

- Code of Construction Practice ("CoCP") (ES Appendix 4.1, DCO Document Reference 8.15)
- Master Construction Environmental Management Plan ("CEMP") Ver.02 (ES Appendix 4.2, DCO Document Reference 8.14)
- AGVMP Ver. 02 (Appendix 9.11, DCO Document Reference 8.12)
- Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10)

8.4.5 The CoCP (DCO Document Reference 8.15) forms a minimum set of principles with which each Contractor must comply and will form the basis of the CEMP to be prepared by the individual Contractors. A Master CEMP Ver. 02 has also been prepared and is presented in the ES Appendix 4.2 (DCO Document Reference 8.14).

8.4.6 The final version of the CoCP (DCO Document Reference 8.15) and the Master CEMP Ver. 02 (DCO Document Reference 8.14) will be issued as part of the documentation for the invitations to tender for the construction of the DCO Scheme. The final versions of the CoCP (DCO Document Reference 8.15) and the Master CEMP Ver. 02 (DCO Document Reference 8.14) will reflect refinements resulting from the detailed design and any additional commitments made to the Planning Inspectorate during the examination of the DCO Scheme. The contractors will prepare their own CEMPs compliant with the CoCP (DCO Document Reference 8.15) and the Master CEMP Ver. 02 (DCO Document Reference 8.14), which will be approved by the relevant local planning authority. Many of the measures proposed in the Master CEMP Ver. 02 (DCO Document Reference 8.14) meet the criteria for protective measures appropriate for inclusion in the Stage 2 appropriate assessment because they are certain to reduce or avoid harm to qualifying habitats of a European site.

8.4.7 The Master CEMP Ver. 02 (DCO Document Reference 8.14) states the requirement for the appointment of an ecological clerk of works ("EcCoW") to ensure compliance with the ecological deliverables for the DCO Scheme. All staff on site will receive a briefing on the

ecological sensitivities as part of their site induction. In addition, toolbox talks will be given by the EcCoW when activities have specific risks to ecological receptors. These talks will highlight the measures that will be implemented to protect the ecological sensitivity of the particular feature.

8.4.8 The protective measures which mitigate impacts on biodiversity are set out in Chapter 6 of the Master CEMP Ver. 02 (DCO Document Reference 8.14) and the key points are highlighted in the following paragraphs.

8.4.9 Fences will be installed from adjacent land where specified in the Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10). Fencing will have 1 m clearance on both sides of the fence to allow installation. Where areas of vegetation are marked as 'to be retained' the fence will be installed from adjacent land where the Order limits allow, and vegetation will be cut back locally to allow installation, where possible. Where there is no allowance on adjacent land within the Order limits, the contractor will need to cut back vegetation locally to allow installation of the fence line from the railway side. If this is not possible, an alternative mitigation plan will be agreed once the contractor is appointed and approved by the Applicant for further scope of works.

8.4.10 Vegetation clearance will be supervised or checked by the EcCoW as necessary.

8.4.11 Clearance of vegetation in the Avon Gorge Woodlands SAC will be as specified in the AGVMP Ver. 02 (ES, Appendix 9.11, DCO Document Reference 8.12), which includes ecological supervision by staff competent at identification of rare plants.

8.4.12 Where clearance of vegetation is necessary, the contractor will where practicable, maintain the vegetative feature intact as long as possible, and by keeping vegetation clearance to the minimum required.

8.4.13 The site extents and areas of site clearance and retained habitat will be demarcated, using a method approved by the relevant planning authorities, to prevent accidental incursions by construction plant and equipment. Specific demarcation is required in the Avon Gorge Woodlands SAC as specified in the AGVMP Ver. 02 (ES, Appendix 9.11, DCO Document Reference 8.12).

8.4.14 Vegetation clearance required for temporary construction works will be reinstated in the first available planting period following the completion of construction. Trees designated to be retained on site will be protected by protective fencing prior to the commencement of works to prevent encroachment of plant and accidental damage of the habitat, in line with BS 5837:2012 *Trees in relation to design, demolition and construction*.

8.4.15 Retained habitats will also be protected by appropriate fencing and signage to avoid incursions and accidental damage. This is particularly important within the Avon Gorge Woodlands SAC, which includes the tow path adjacent to the River Avon. Rare plants and protected grassland habitat are present along some areas of the River Avon Tow

Path, which may be affected by inadvertent damage from vehicular access along the tow path to access structures in the Avon Gorge. The contractor will limit the frequency of use by vehicles to three to four trips a day, enforce speed limits and protect areas of rare plants and grassland by fencing, to prevent accidental damage. The retained habitats will be regularly checked by the EcCoW.

8.4.16 Unless otherwise advised by the Environment Agency, the contractor will have regard to the Environment Agency's Pollution Prevention Guidance ("PPG") during works close to ditches, watercourses and culverts.

8.4.17 Construction noise will be managed as detailed in Chapter 10 of the Master CEMP Ver. 02 Noise and Vibration (DCO Document Reference 8.14). Works on the disused line will be primarily daytime working but occasional night time working will be necessary. Due to line closures, 24 hour working will be required in the Avon Gorge.

8.4.18 The contractor will also have regard to the requirements of the Master CEMP Ver. 02 (DCO Document Reference 8.14) relating to dust and air quality, noise and vibration, and protection of the water environment, to protect ecologically important habitats and species adjacent to the construction site. These measures include:

- Limit, manage or prevent access to areas adjacent to watercourses and water bodies to prevent physical and water quality impacts on them;
- Reduce discharges of stormwater and sediment from construction sites and compounds into watercourses and other water features, implemented through a surface water management plan;
- Comply with the necessary consents where works are required in or adjacent to watercourses;
- Provide appropriate reporting of water pollution incidents; and
- Reduce soil exposure areas and see that surfacing or re-vegetation of bare areas is undertaken as quickly as possible to reduce potential sediment runoff.

8.4.19 The Contractor will be required to adopt good working practices, for example as detailed in CIRIA publications; including C532: Control of water pollution from construction sites, C648: Control of water pollution from linear construction projects: technical guidance (C648) and C649: Control of water pollution from linear construction projects site guide.

8.4.20 Although the Environment Agency no longer provides advice on good practice, implemented measures should reflect previously issued (though now withdrawn) PPG documents, for example: General Guide to Prevention of Pollution (PPG 1); Above ground oil storage tanks (PPG2); Treatment and disposal of sewage where no foul sewer is available (PPG 4); Works and maintenance in or near water (PPG5); Maintenance of structures over water (PPG23); and Drums and intermediate bulk containers in relation to chemical storage, handling and use (PPG26).

Avon Gorge Woodlands SAC

8.4.21 A comprehensive five-year (2021-2026) management plan for vegetation in the Avon Gorge Woodlands SAC has been proposed for the DCO Scheme (see ES Appendix 9.11 AGVMP Ver. 02, DCO Document Reference 8.12). The measures proposed in the AGVMP Ver. 02 (DCO Document Reference 8.12) have been developed with reference to NR's SMS 2018-2023 and Vegetation Management Plan ("VMP") (ES Appendix 9.15, DCO Document Reference 6.25). The work plan for the four years of the VMP is being developed by NR and a draft is currently being discussed with NE. The SMS and VMP set out NR's proposals to reduce or avoid adverse effects on the SAC from maintenance operations on the rail infrastructure. NR is also developing conservation measures to correspond to the ecological requirements of the SAC. The purpose of these measures will be to maintain or restore favourable conversation status of the SAC, taking into account economic, social and cultural requirements and regional and local characteristics. These proposals are part of NR's obligation in respect of the SAC and are separate to the mitigation and compensation measures proposed as part of the DCO Scheme. As final details are not yet available of NR's conservation measures, NSDC has developed an adaptive approach to the delivery of mitigation and compensation measures as part of the DCO Scheme through which NE will be able to secure the best alignment between the NR conservation measures and the preventative and compensatory measures proposed by the DCO Scheme.

8.4.22 The measures within the AGVMP Ver. 02 that are considered to be mitigation for the impacts of the DCO Scheme because they reduce or avoid the impacts of the scheme are described below. Further mitigation measures to avoid impacts on SAC grassland, ancient woodland, rare whitebeam trees, Bristol rock-cress and other rare or notable plant species on rock faces will be considered during the detailed design stage. Detailed surveys of the rock faces will be undertaken during the detailed design of the geotechnical works and impacts on important habitats and species will be avoided, where possible. In addition, NR may be able to reduce the amount of new and replacement fencing within the Avon Gorge or undertake the fencing differently in key areas of sensitivity, subject to detailed design. This would reduce the amount of vegetation to be removed for fence installation.

Mitigation during construction

8.4.23 Vegetation clearance would be required initially to establish an adequate works footprint and operational corridor for the proposed construction works. During vegetation clearance, measures are proposed to avoid harmful effects on features of the Avon Gorge Woodlands SAC that meet the standard of preventative measures that can be taken into account in Stage 2 Appropriate Assessment. These are measures that are routinely carried out by NR and its contractors. The key measures taken to avoid or reduce harm to qualifying features are as follows:

Site briefings

8.4.24 Vegetation clearance and tree works would be undertaken by an appropriately qualified Contractor, overseen by NSDC. All site personnel will receive a general site briefing on the sensitivity of the Avon Gorge Woodlands SAC and the need for the implementation of sensitive working practices in these areas from an EcCoW. Those working in the Avon Gorge will receive a site-specific briefing, which will outline applicable legal protection and working practices for the actions they will be undertaking. A signed record of attendance at site briefings will be maintained for the duration of the project.

Demarcation of sensitive species

8.4.25 To minimise damage to SAC qualifying habitats during both the construction and operational aspects of the DCO Scheme a consistent method of demarcation will be developed for the site. The method of demarcation will need to be appropriate for both construction and operational input and will need to be developed by an appropriately qualified ecological specialist.

8.4.26 Although the precise method of demarcation is yet to be determined it would be advisable to consider methods such as Passive Integrated Transponder ("PIT") tags for sensitive tree species, namely rare whitebeam. It is likely that more conventional methods of demarcation namely tape, barrier and paint may also be needed during the construction phase to provide a visual guide to the Contractor, but these measures should be removed upon completion of the works.

8.4.27 Demarcation of coppiced rare whitebeam tree stumps will be particularly important to ensure that they are left to regrow within a coppice cycle if appropriate for long term management.

8.4.28 Sites for other rare and protected plant species will be fenced with barrier tape and warning signs to avoid accidental damage until work on them is required, which will be done under supervision of a suitably experienced ecologist.

8.4.29 The supervising ecologist will need specialist botanical skills in rare plant identification. The timing for the demarcation and fencing of the site will be critical for grassland species and rare woodland ground flora because it will be dependent on the plants being present and being able to identify them. They may have to be identified well in advance of the works and this should be factored into the construction programme.

Management of Arisings

8.4.30 Managing the vegetation will produce arisings. A well-managed and healthy woodland habitat should contain a variety of plant species of age, size and decay. Dead wood/plants provide nutrients and CO_2 to soils to plants, bacteria, animals and bugs. However, arisings can cause enriched soil and promote weed growth, therefore, the management of arisings in the grassland and woodland qualifying features is considered separately below.

Semi-natural Dry Grassland

8.4.31 No timber or arisings are to be left in grassland areas. Small quantities of cut grass can remain on site to decay but not on areas of species rich grassland or rare species. Large amounts of grass and scrub should be raked and removed from site or piled into an edge of scrubland (of no significant value). Raking should be carried out carefully where rare species are present to avoid damaging the plants.

Tilio-Acerion Woodland

8.4.32 No timber or arisings from invasive and non-native species ("INNS") will be left on site so as to remove seed sources and inhibit natural regeneration of INNS.

8.4.33 Annex L of Appendix 9.11 AGVMP Ver. 02 (DCO Document Reference 8.12) identifies specific locations where arisings can be stored temporarily and locations for the provision of deadwood. The majority of the felled trees will be removed from site. However, retention of some dead and decaying wood contributes to the structure and function of the *Tilio-Acerion* woodland (Natural England, 2019), with a target of 3-5 fallen trees of diameter >300 mm per hectare. The retained felled trees must not obstruct light for SAC qualifying habitats or rare species or smother other species or pose a risk to their stability. No trees will be chipped and left on site.

8.4.34 Brash from felled trees, or from limb reduction or lifting will be removed from site. Where trees have been coppiced, a small percentage of brash (not from invasive non-native species) will remain on site and can be piled over each coppice stool to act as a physical barrier to help deter deer from eating shoots of new growth, although it cannot be assumed that a small amount of brash will provide the necessary deterrent, particularly if the deer population is high or muntjac deer are present in the woodlands. The FC has confirmed, however, that they have found that piling brash around coppiced trees is a good deterrent to deer browsing (FC, pers comm).

Tree Surgery

8.4.35 All proposed tree works will be carried out by a suitably qualified and insured contractor preferably registered with the Arboricultural Association. Tree work will be carried out in accordance with BS 3998:2010 *Tree Work - Recommendations*. Under no circumstances shall any tree pruning be undertaken by construction personnel.

8.4.36 All operations must be carried out to avoid damaging neighbouring retained trees. Trees to be retained must not be used for anchorage or winching purposes.

Tree Felling

8.4.37 Prior to felling, any adjacent retained trees (rare whitebeam trees will be marked) will be protected from cut material falling on them.

8.4.38 The stumps of invasive non-native species only will be treated with plugs of herbicide within 24 hours of felling. It is particularly important that all stumps of holm oak are treated (even small ones). Herbicide treatment would be specified in the Contract and agreed with NE.

Mitigation for Quarry Bridge No. 2 site compound

8.4.39 NR's current methodology and design for the ramp and site compound area is included in Annex C of Appendix 9.11. Mitigation includes use of limestone hardcore on the ramp, avoiding and protecting rare whitebeam trees by fencing and temporary fencing around the construction compound. The underlying grassland vegetation will be protected as far as possible by the temporary relocation of boulders, wood piles and construction materials on geotextile membranes to aid removal after construction works have been completed. The ramp will be constructed from imported clean limestone aggregate placed on geotextile membranes.

8.4.40 Access to the compound will be required along the River Avon Tow Path by vehicles approximately three to four times a day.

8.4.41 Prior to construction works commencing, a full ecological survey of the area to be affected by the works will be completed, focusing on identifying any rare or protected species.

8.4.42 After completion of the construction works, the areas of grassland and scrub affected by the site compound within National Trust ownership will be monitored for two years to ensure that it is not affected by ruderal weeds on the disturbed ground after the construction works have been completed. If ruderal weeds affect the disturbed ground, this would be managed by topping and/or spot spraying the ruderal vegetation. The area will not be re-seeded unless there is a high concentration of weeds and the ground is not recovering. If this is the case, then short, native, local provenance limestone species, obtained from a reputable seed supplier, will be sown to restore the site.

Non-native and invasive plants

8.4.43 The spread of non-native and invasive plants will be avoided through identification of these species by the ECoW, tool box talks to make Contractors aware of their presence and threat, and through careful planning of access and use of machinery to avoid spread in compliance with the Master CEMP Ver.02 (ES Appendix 4.2, DCO Document Reference 8.14).

Management during operation

8.4.44 Once the DCO Scheme is operational, maintenance and vegetation management are the responsibility of NR. The AGVMP Ver. 02 (DCO Document Reference 8.12) for the DCO Scheme sets out a programme management and monitoring, the implementation of which is the responsibility of NSDC and is addressed as part of compensatory measures in Section 11. The AGVMP Ver. 02 (DCO Document Reference 8.12) provides guidance and recommendations for management activities that should be adopted by NR in future versions of the SMS and VMP.

8.4.45 The current NR SMS is valid for 5 years from 1 July 2018 until 30 June 2023 and describes the routine maintenance activities required to permit the safe passage of trains in the Avon Gorge Woodlands SAC / Avon Gorge SSSI (ES Appendix 9.15, DCO Document Reference 6.25). The VMP is appended to the SMS and sets out the additional

vegetation management required to ensure safe operation of the railway whilst also allowing for conservation and enhancement of the qualifying features of the Avon Gorge Woodlands SAC. These documents are independent of the DCO Scheme and therefore the measures described therein do not constitute mitigation of the DCO Scheme.

8.4.46 The maintenance activities that have potential to impact the SAC are considered as follows:

- Removal or stabilisation of dead, dying or diseased trees
- Removal of invasive non-native species
- Scrub clearance
- Herbicide spraying
- Rock face inspection and maintenance.

8.4.47 The VMP states that operations will be planned such that the risk of windthrow is not increased following felling. Windthrow could impact rail infrastructure as well as woodland qualifying habitats within adjacent landowner boundaries.

8.4.48 Arisings from vegetation management will be managed as outlined in paragraphs 8.4.31-8.4.35 above.

8.4.49 The outcomes of the VMP are to enhance the qualifying features of the SAC, with the objective of achieving the following on operational land within NR's ownership.

- Reduction of cover and abundance (and ideally eradication) of INNS and seed source which is spreading to and from NR land and impacting on the wider SAC habitat.
- Opening of the canopy to allow more light to enter and allow lower canopy species and ground level species enough light to compete.
- Removal of scrub and competing species from grasslands to ensure biodiversity remains high but the qualifying species are given opportunity to flourish.
- Removal of canopy around the track edges to allow whitebeams the opportunity to grow up, away from the track. This ensures their encroachment does not require intervention to manage them.
- Provide more favourable conditions for the succession of whitebeam evolution that is currently being witnessed.
- Net positive biodiversity across the SAC designated area of the Avon Gorge under NR control.

North Somerset and Mendip Bats SAC

8.4.50 LSE for greater and lesser horseshoe bats that could comprise part of the SAC population have been identified as a result of severance of navigational routes due to vegetation removal and lighting impacts. A

range of mitigation measures to avoid and reduce effects on bats are presented in ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12). A number of these measures are provided primarily to address legal requirements for bats (specifically those to address roost loss, disturbance and killing/injury of bats), separate to issues specific issues relating to the HRA. Therefore, the aim of the measures outlined below is to retain and enhance habitat and features of value to bats to retain landscape permeability along the route of the DCO Scheme.

8.4.51 Vegetation will be retained along the disused line to help maintain the character of the rail corridor. The vegetation retained is identified in the Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10) and the design has aimed to maintain vegetation on at least one side of the line.

8.4.52 Access routes to install fences from adjacent land have been included in the DCO Scheme to avoid additional vegetation being removed from the line to access the fence line at the edge of the rail corridor, as identified in the Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10).

8.4.53 Low scrub vegetation growth will provide adequate cover for sheltered bat flight lines within the Portbury Wharf area and through farmland around Sheepway, but taller vegetation for screening is required at Royal Portbury Docks to obscure lighting and activities in the port to maintain a dark corridor. This is particularly important between Portbury Dock Road and Marsh Lane where Port facilities with lighting is present on both sides of the disused line. The retained vegetation, railway embankment and topography of the land within the rail corridor will provide some sheltered flight areas for lesser and greater horseshoe bats until the new planting establishes (approximately 15 years).

8.4.54 Scrub vegetation from the centre of the Portishead to Pill line will be removed to construct the DCO Scheme between Portbury Dock Road and Marsh Lane. However, tall scrub and tree vegetation will remain to the north and south of the Portishead to Pill line. Fencing will be installed from the railway or cycle track alongside retained vegetation to minimise loss. There will be some loss of existing vegetation to the west of Marsh Lane approximately 1 m either side of a fence to be installed (Railway Landscape Plans (Disused Line), DCO Document Reference 2.10). However, vegetation will be retained around the fence line and vegetation will grow back. Severance of bat flight lines due to light spill from adjacent Port facilities is considered to be unlikely.

8.4.55 The landscape proposals are summarised as follows:

- South of Trinity Primary School Bridge – woodland planting to the north and vegetation retained south of the line;
- Sheepway Bridge – short section of tree lined hedge planted to the north and vegetation retained to the south of the line;
- Between Sheepway Farm and Station Road – hedges, with trees where space allows, planted north and south of the line and vegetation retained;

- Station Road to Drove Track – hedges planted south of the line;
- West of Royal Portbury Dock Road – retain vegetation and additional woodland planting to the north of the line;
- Royal Portbury Dock Road to Marsh Lane – vegetation retained to the north of the line except were new fencing is required towards Marsh Lane. NR has confirmed that the vegetation clearance is required 1 m either side of new fences for construction;
- Marsh Lane to the M5 – hedges, with trees where space allows, planted to the north and retained vegetation and scrub planting to the south;
- M5 and Lodway Farm – additional woodland mix planted and retain vegetation to the south and hedgerow planting to the north;

- Pill – individual trees planted around Pill Station Car park to the north and a hedge to be planted to the south.

8.4.56 The M5 bridleway extension, which is part of the DCO Scheme, and the existing cycle path, will provide alternative navigational features for bats under the motorway.

8.4.57 The landscape design for the DCO Scheme would retain a landscape feature for commuting and foraging bats that will provide a navigational route for the movement of lesser and greater horseshoe bats between populations in the region. The landscape planting would restore vegetation impacted during construction and mitigate changes to habitat management for track maintenance.

8.4.58 When operating, the Portishead to Pill line will remain a landscape feature and navigational route for bats and vegetation clearance will only be undertaken where it is necessary to ensure a 3 m width from the running rail is clear of vegetation. Natural regeneration is expected to develop post-construction and successional scrub communities (such as bramble) that establish in year 1 will provide sheltered commuting routes for species such as lesser and greater horseshoe bats.

8.4.59 Further mitigation by planting vegetation on the disused line is limited due to NR operational widths. However, mitigation by infill planting in an area of 0.52 ha in total will be undertaken within land owned by NSDC alongside the A369 Portbury Hundred, as detailed in ES Appendix 9.16 (DCO Document Reference 6.25). This road is a prominent landscape feature and is within the home range of the radio-tracked greater horseshoe bats (ES Appendix 9.2 Ver. 02, DCO Document Reference 6.25). Numerous hedgerows link the A369 to the disused line through farm land.

8.4.60 [Paragraph deleted from revised version.]

8.4.61 [Paragraph deleted from revised version.]

8.4.62 [Paragraph deleted from revised version.]

8.4.63 [Paragraph deleted from revised version.]

8.4.64 The extension of national cycle route 26 bridleway would not be lit to minimise disturbance.

8.5 Assessment of Adverse Effects on Integrity

8.5.1 The integrity matrices are provided in Annex E of this HRA which summarise the assessment of adverse effects on integrity.

Avon Gorge Woodlands SAC

8.5.2 The design of the DCO Scheme has been developed to minimise habitat loss and other impacts on the Avon Gorge Woodlands SAC, e.g. by avoiding rare whitebeam trees from telecommunication mast installation.

8.5.3 During detailed design and through into construction there will be further opportunities to reduce impacts on the Avon Gorge Woodlands SAC in respect of micro-siting elements of works, as set out in Section 9.5, to avoid qualifying features and individual whitebeams where this is practically achievable.

8.5.4 Furthermore, the preventative measures proposed, as described in the AGVMP Ver. 02 and in Section 8.4 above, will reduce and avoid some adverse effects during the construction stage. However, there is unavoidable loss of woodland and grassland qualifying features.

8.5.5 As a result of the DCO Scheme, there is a predicted loss of 0.73 ha of qualifying woodland habitat, which represents 0.69% of a total of 105.75 ha within the SAC (Table 8.2). *Tilio-Acerion* woodland is a Priority Habitat and approximately 55% of the woodland loss (0.4 ha in area) is semi-natural ancient woodland, which is an irreplaceable habitat. This is considered a permanent habitat loss, as semi-natural ancient woodland takes centuries to develop as a functioning ecosystem. The definition of such woodland is that there has been continuous wooded cover since 1600 AD and therefore the habitat cannot be re-created. Therefore, the loss of woodland habitat is considered an adverse effect on integrity.

8.5.6 Loss of *Festuco-Brometalia* SAC-qualifying grassland is mainly due to the site compound at Quarry Bridge No. 2, fencing and work on rock-faces which could damage or destroy individual plants of Bristol rock-cress. The loss is estimated at 0.06 ha of a total of 6.93 ha in the SAC (0.84%), some of which is considered a temporary loss, albeit over a number of years, for the duration of the construction phase and the time taken for the habitat to regenerate or to be restored. It is anticipated that grassland species could readily regenerate along the fenceline but the new vegetation is likely to be lower in conservation value, characterised by ruderal species and scrub would develop if left unmanaged. The grassland area within the site compound will require extensive intervention to re-create and restore to a grassland habitat (paragraphs 8.4.40 – 8.4.43). Given the limited extent of grassland in the SAC (6.93 ha) and the uncertainties of success and time taken to

restore this habitat, it is considered that there is an adverse effect on integrity due to loss of this habitat.

8.5.7 Habitat loss would include the loss of up to 27 rare whitebeam trees which are a key species of the SAC qualifying woodland habitat, but also occur within transitional scrub and in the qualifying grassland habitat. Six rare whitebeam species would be affected as summarised below in Table 8.5. The key impacts would be on the Avon whitebeam where 12 of the total population of c. 42 trees would be affected (29% of world population). However, it is anticipated that the loss of whitebeams can be reduced through further refinement of the construction activities, and that greater certainty is likely to emerge prior to the determination of the DCO application.

Table 8.5: Whitebeam species affected by the DCO Scheme

Species	IUCN conservation status	Number of trees potentially affected
Avon whitebeam *S. avonensis*	Critically Endangered	12
Bristol whitebeam *S. bristoliensis*	Endangered	2
Round-leaved whitebeam *S. eminens*	Vulnerable	5
Grey-leaved whitebeam *S. porrigentiformis*	Nationally scarce	1
Leigh Woods whitebeam *S. leighensis*	Endangered	6
Wilmott's whitebeam *S. wilmottiana*	Endangered	1

8.5.8 During construction, those impacts relating to habitat degradation via invasive species transfer and incursions in qualifying woodland and grassland habitats would be mitigated by preventative measures that are known to be effective and can be secured through the DCO. These include site briefings, the presence of an ECoW, demarcation of sensitive species and careful planning of access and use of machinery to avoid spread in compliance with the Master CEMP Ver**.** 02 (DCO Document Reference 8.14). No habitat degradation is therefore anticipated via these pathways.

8.5.9 NR maintenance during the operation phase is separate to the DCO Scheme, but it is recommended in the AGVMP Ver. 02 that operations will be planned such that the risk of windthrow is not increased following felling. Given that windthrow could impact rail infrastructure as well as woodland qualifying habitats within adjacent landowner boundaries this is a key requirement for the SMS. No habitat loss is therefore anticipated as a result of windthrow during operation. Vegetation clearance to maintain a 3 m corridor either side of the line and the removal of overhanging trees for health and safety reasons during the operation of the DCO Scheme will limit the extent to which

woodland vegetation can re-establish after construction but will not result in further habitat loss above that already cleared in the construction phase.

8.5.10 Taking into the account the proposed preventative measures, no adverse effects on SAC qualifying features are predicted for the DCO Scheme via habitat degradation or windthrow.

8.5.11 However, the loss during construction of 0.06 ha of *Festuco-Brometelia* grassland and 0.73 ha of *Tilio-Acerion* woodland Priority habitat, some of which is irreplaceable ancient woodland, cannot be fully mitigated. Therefore, it cannot be ascertained that the DCO Scheme will not adversely affect the integrity of the Avon Gorge Woodlands SAC.

North Somerset and Mendip Bats SAC

8.5.12 The DCO Scheme lies within, at the outer extent of, Zones B and C of the North Somerset 'Bat Consultation Zone' (North Somerset Council, 2018) >9 km from the nearest component of the SAC (Brockley Stables SSSI). The radio-tracking study of a male greater horseshoe bat in 2015 and a lactating female greater horseshoe bat in 2018 demonstrated that there is movement between the disused railway line area of the DCO Scheme and Brockley Hall Stables SSSI/the SAC.

8.5.13 Based on the SAC guidance (North Somerset Council, 2018) greater horseshoe bats (which have larger foraging area requirements than lesser horseshoe bats and thus where their needs are met, lesser horseshoe bat needs will also be met) mostly forage within 2.2 km of the maternity roost and can make regular use of key foraging habitat within 4 km and in some cases up to 8 km. Other SAC roosts (including hibernation roosts) require less foraging area with distance for greater horseshoe bats considered to be up to 2.4 km. Therefore, given the distance of the DCO Scheme from the closest component of the SAC, the DCO Scheme is unlikely to be a key foraging habitat for SAC population bats and SAC bats are likely to be using the DCO Scheme in low densities, reducing the potential for adverse effects on the integrity of the SAC.

8.5.14 Not all the horseshoe bats using the DCO Scheme site will be SAC population bats and it is considered that whilst the DCO Scheme could impact upon individual greater and lesser horseshoe bats, some of which are from the SAC populations, only very small numbers are likely to be affected and thus adverse effects on the integrity of the SAC are unlikely.

8.5.15 The mitigation measures proposed as part of the DCO Scheme would reduce further the potential for adverse effects.

8.5.16 At Royal Portbury Dock, vegetation will be retained as far as possible and additional woodland planting is proposed to the west of Portbury Dock Road to maintain a dark corridor at this location. The lighting levels for the Bristol Port Company's adjacent Court House Farm development are < 0.5 lux, which is less than or equivalent to the pre-development lighting light levels. Actual light levels within the corridor are to be monitored by the Port to ensure this is the case, as part of their planning conditions. However, a lighting survey undertaken as

part of the DCO Scheme in July 2019 indicates that lighting levels in the centre of the disused line are 0.5 lux or less (ES Appendix 9.17).

8.5.17 Scrub vegetation from the centre of the disused line will be removed for construction of the DCO Scheme. However, tall scrub and tree vegetation will remain to the north and south of the disused line. Fencing will be installed from the railway or cycle track alongside retained vegetation to minimise loss. There will be some loss of existing vegetation to the west of Marsh Lane (1 m either side of a fence to be installed, DCO Document Reference 2.10 Railway Landscape Plans (Disused Line)). However, vegetation will be retained around the fenceline and vegetation will grow back. Evidence suggests there would be no in-combination effects here in terms of severance of bat flightlines via light spill.

8.5.18 [Paragraph deleted from revised version.]

8.5.19 Taking into the account the small numbers of SAC bats likely to be impacted by the DCO Scheme, given its distance from the SAC, and the proposed preventative measures, most of which are directed at protection of species rather than the designation itself, it is concluded that there will be no adverse effects on the integrity of the SAC either alone or in-combination with other plans or projects.

SECTION 9

Assessment of Alternatives (HRA Stage 3)

9.1 Introduction

9.1.1 The Stage 2 Appropriate Assessment concluded that the loss during construction of 0.73 ha of *Tilio-Acerion woodland* and 0.06 ha of *Festuco-Brometalia grassland* cannot be fully mitigated. Accordingly it has not been possible to conclude that there will be no adverse effect on the integrity of the Avon Gorge Woodlands SAC. If the SoS is minded to proceed, notwithstanding a negative assessment of the implications of the DCO Scheme for the Avon Gorge Woodlands SAC then Regulation 64 of the Habitats Regulations sets out the process that must be followed. The first of these stages is HRA Stage 3: establishing that there are no alternative solutions to the DCO Scheme that would have a lesser effect or avoid an adverse effect on the integrity of the SAC.

9.1.2 This HRA stage 3 assessment of alternatives now sets out the alternatives that have been evaluated in respect of the DCO Scheme. The alternatives evaluated in respect of the DCO Scheme are explained in respect of the following:

- transport mode selection,
- railway alignment selection,
- train service frequency selection,
- opportunities to avoid or have a lesser effect on the European Site; and
- the do nothing option/no scheme option.

9.2 The Portishead to Bristol Transport Corridor Mode Selection

9.2.1 The strategic need for the DCO Scheme and its objectives form an integral part of the transport mode selection, and are set out in the evaluation of alternatives to a railway line. The corridor is approximately 15 kilometres from Portishead town centre and Bristol city centre. The transport mode choices along the corridor are limited, compared with other corridors feeding into Bristol city centre. The corridor compromises the A369 highway, the Portbury Freight Line and a cycle route (NCN 26) much of which is unsurfaced, un-lit and difficult to cycle in winter. The A369 which has a single carriageway in each direction, is dissected west of Pill village by Junction 19 of the M5. As a result of the limited travel choices the dominant mode of choice is the car, despite the significant congestion at peak times along the route, in particular at Junction 19 and at Ashton in Bristol. In addition there are limited alternatives to the route when congestion or disruption occurs. The strategic need for improvements in the Portishead Bristol transport

corridor was first identified in 1986 and in the ensuing 20 years different module options were considered. Following the Greater Bristol Public Transport Corridor Options Study in 2007 work on the technical feasibility of re-opening the branch line were undertaken. Subsequent local and sub-regional studies and plans followed and in 2012 it was resolved to accept the study recommendations and to proceed with the re-opening of the branch line to provide a railway service from Portishead to Bristol. This section identifies the features of the Portishead to Bristol transport corridor, the pressures that have built over recent decades, the imperatives that underpin the DCO Scheme, the work that has been undertaken on transport mode options and the selection of railway as the only feasible option for the Portishead to Bristol transport corridor explained.

9.2.2 The population along the corridor has dramatically increased over the last few decades. This, together with the projected scale of growth across the sub-region, raises serious transport challenges for the five local authorities. For example, the population of Portishead in 1961 was 6,440, while today the population has increased to over 30,000. Further development in the town is proposed resulting in further projected population growth over the next few years. As demand on the transport corridor increases as a result of population and economic growth, further transport infrastructure investment is needed to ensure the corridor is sufficiently accessible and has sufficient capacity and resilience to continue to meet the needs of resident, business and visitors. Longer-term problems of sustained traffic growth and car dependency also need to be tackled, in addition to wider long-term issues of carbon emissions and social wellbeing arising from increased mobility in particular for those without access to the private car.

9.2.3 The average speed by car from Portishead town centre to Bristol city centre is around 12 mph during the morning peak with a journey time of 50 minutes for the 9 miles (15 kilometre) distance. The A369 and surrounding highway network suffers from a lack of network resilience and, consequently, unreliable journey times. At the Portishead end, queuing onto and off the M5 at junction 19, impedes traffic flow on the A369. At the Bristol end of the corridor, systemic levels of traffic congestion starting in Ashton/ Bower Ashton and continuing into the city centre result in very low average speeds and extended journey times.

9.2.4 In addition to the poor journey times by car, the corridor also has poor journey time reliability as a result of incidents and accidents on the M5, whereby motorists are diverted onto the A369 at junction 19, causing widespread delays and disruption to the whole corridor. This fundamental lack of resilience of the strategic and local road network is reflected in data published by Inrix traffic data showing that the WoE is the sixth most congested city region in the UK, after London, Edinburgh, Glasgow, Birmingham and Manchester. The WoE had a recorded 619 traffic hot spot incidents over 12 months with the worst recorded incident at junction 20 on the M5 leading to 15 hour delay which resulted in traffic problems up to 36 miles away.

9.2.5 The problems caused by:

- poor highway journey times,
- poor journey time reliability,
- continued worsening of traffic congestion and
- limited travel choices on the corridor,

impact on human health and public safety. The continued dependency on the car as the major mode of transport for the corridor will also continue to result in impacts on human health and public safety, which is set out further in HRA Stage 4 – Assessment of IROPI.

9.2.6 In addition the current problems also impact on the local economy. The impacts on business from the poor journey times, reliability and congestion spread into the labour market and place extra costs on business due to increased operating costs of vehicles, more non-productive time spent travelling and wider productivity impacts from the reduction in the potential for business clustering. The importance of journey times and journey time reliability to the local economy is reflected in the economic appraisal of major transport schemes through the DfT's WebTAG technical guidance. The MetroWest Phase 1 Outline Business Case December 2017 is fully WebTAG compliant and forms part of the DCO application submission. Both this HRA stage 3 assessment of alternatives and the HRA stage 4 assessment of IROPI, draw on the Outline Business Case for the one train per hour scheme.

9.2.7 Initial technical feasibility studies to re-open the Portishead Branch Line identified that a journey time of between 17 to 23 minutes could be achieved by passenger train between Portishead and Bristol Temple Meads, depending on line speed and stopping pattern at local stations. This work informed the evolution of the engineering design and the GRIP 3 Single Option Selection design for the DCO Scheme resulted in a 23 minute journey time from Portishead and Bristol Temple Meads.

9.2.8 This passenger train journey time represents a dramatic improvement compared with existing highway based modes on the corridor and are shown in Table 9.1 below.

Table 9.1: Journey time comparisons (AM peak)

Route	Bus	Car	Passenger Train without Scheme	Passenger Train with Scheme
Portishead to Bristol AM	Over an hour *	50 mins *	N/A	23 minutes

9.2.9 This clearly demonstrated that highway based modes (car, bus, etc) were uncompetitive in terms of journey times compared with passenger train. The divergence between the highway based journey times and the passenger train was so substantial that there was no realistic prospect of delivering a highway based mode enhancement for the corridor that could achieve a journey time anywhere close to 23

minutes. This is because any highway based mode would have to overcome the strategic bottle necks at both ends of the corridor. With junction 19 of the M5 at the Portishead end and systemic congestion at the Bristol City Centre end of the corridor, the current average speed on the corridor would have to increase from 12 mph to around 25 mph. A further issue in the modal selection for the corridor was that passenger rail journey times do not tend to erode over time, in the context of a branch line feeding into Bristol. By comparison there has been a long term trend of highway journey times increasing across the sub-regional highway network, due to the continued growth in traffic volumes.

9.2.10 As the highway network has continued to become congested over the last few decades the volumes of demand for travel by passenger rail across the sub-region have also experienced long term growth. The Office of Rail and Road's published passenger trip figures show a 63% increase between 2006/07 to 2015/16 (https://dataportal.orr.gov.uk/). The Outline Business Case (DCO Document Reference 8.4) for the DCO Scheme reports that the annual WoE Rail Survey which counts all passengers, not just ticket sales, shows higher total growth at 93% across all local stations and average growth per annum of 6.9%. The These long term trends supported strong messages received from residents and business about the need for more investment in the local railway network. In particular there is a need to address the limited geographic reach of the local rail network, the irregular/inadequate train service frequency on some corridors and train overcrowding problems. For further information refer to the MetroWest Phase 1 Outline Business Case, December 2017 (DCO Document Reference 8.4) https://metrowestphase1.org/large-local-major-schemes-bid-for-construction-funding/. Chapter 1 The Strategic Case and Chapter 2 The Economic Case set out the background justification for intervention and the value for money.

9.2.11 The reopening of the Portishead branch line was initially considered in 1986, but the proposing organisation went into liquidation. During the early 1990s different modal options were looked at for the corridor, with heavy rail considered in 2001. A major part of the branch line was re-opened in 2001 to freight trains operating from Royal Portbury Dock (west of Pill village) to Bristol and beyond. The Greater Bristol Strategic Transport Study (2006) explored the potential for rapid transit and heavy rail with new stations at Pill and Portishead and the outputs of the study informed JLTP 2. JLTP2 (2006) identified the re-opening of the Portishead branch line as the preferred for long-term scheme for the corridor.

9.2.12 In 2007 the Greater Bristol Public Transport Corridor Options Study considered Bus Rapid Transit on the operational rail line or via A4 Portway between Portishead and Avonmouth. It identified significant deliverability issues with both options. A fully segregated alignment along A4 Portway was also not considered feasible. Between 2008 and 2010 North Somerset Council commenced a series of initial technical feasibility studies to re-open the branch line. In 2010 NR undertook its Route Utilisation Strategy (Western Route), which tested

the feasibility of various service enhancements to the local rail network to establish a Greater Bristol Metro. In 2011 the JLTP3 identified the re-opening of the Portishead branch line along with the delivery of the Greater Bristol Metro scheme as high priority schemes it provided the policy basis and programme for taking forward both schemes. For further information seehttps://s3-eu-west-1.amazonaws.com/travelwest/wp-content/uploads/2015/05/2013-refresh-and-supplementary-documents.pdf

9.2.13 A sub-regional rail study was undertaken in 2011 by Halcrow to explore further the feasibility and deliverability of the various local rail schemes identified in JLTP3. The study recommended combining the re-opening of the Portishead branch line into the Greater Bristol Metro with delivery through a phased approach. The recommendation for Phase 1 was the re-opening of the Portishead branch line along with service enhancements to the Severn Beach and the Bath Spa to Bristol Line (local service). Following the WoE Rail Study (2011), a formal decision was made in 2012 to accept the study recommendations by the WoE Joint Transport Board and to proceed with the scheme under the name; Great Western Metro Phase 1. The scheme was subsequently re-named MetroWest Phase 1 and the project team was mobilised in 2013. The case for intervention in the transport network is set out in detail in Chapter 1 - The Strategic Case of the Outline Business Case for MetroWest Phase 1, December 2017 (DCO Document Reference 8.4). MetroWest Phase 1's Principal Objectives are:

- The principal objectives of MetroWest Phase 1 are as follows.
- To support economic growth, through enhancing the transport links to the Temple Quarter Enterprise Zone ("TQEZ")[18] and into and across Bristol City Centre, from the Portishead, Bath and Avonmouth / Severn Beach arterial corridors.
- To deliver a more resilient transport offer, providing more attractive and guaranteed (future proofed) journey times for commuters, business and residents into and across Bristol, through better utilisation of strategic heavy rail corridors from Portishead, Bath and Avonmouth / Severn Beach.
- To improve accessibility to the rail network with new and re-opened rail stations and reduce the cost of travel for commuters, business and residents.
- To make a positive contribution to social well-being, life opportunities and improving quality of life, across the three arterial corridors, Portishead, Bath and Avonmouth / Severn Beach.

9.2.14 In addition, MetroWest Phase 1 has the following supporting objectives.

[18] The Bristol Temple Quarter Enterprise Zone is one of the largest urban regeneration projects in the UK. It is located on a 70 hectare site in the centre of Bristol with Bristol Temple Meads railway station at its core. The development was officially opened for business in April 2012, with the aim of creating 4000 jobs in the first five years and 17,000 jobs over its 25 year lifespan.

- To contribute to reducing road based traffic congestion on the Portishead, Bath and Avonmouth / Severn Beach arterial corridors.
- To contribute to enhancing the capacity of the local rail network, in terms of seats per hour in the morning and afternoon peaks.
- To contribute to reducing the overall environmental impact of the transport network.

9.2.15 Further information on the modal option selection can be found in the MetroWest Phase 1 Option Assessment report. https://metrowestphase1.files.wordpress.com/2017/12/appendix-1-2-mw-ph1-option-assessment-report.pdf

9.2.16 In summary, numerous studies and reports have concluded that re-opening of the Portishead Branch Line for heavy rail services is fully justified on the grounds of reducing congestion and increasing mobility. No feasible alternatives to a heavy rail railway as the transport mode for achievement of the project's objectives have been identified. The Portishead Branch Line track bed is *in situ* and large parts are existing operational railway. There is no realistic alternative that will achieve the aims of promoting mobility, reducing congestion and thereby benefiting human health and the environment.

9.3 The Railway Alignment Selection

9.3.1 The Portishead Branch Line is a historic railway alignment that was built in the 1860s. The line closed to passenger trains in 1964 and to freight trains in 1981. In 2002 the part of the former Portishead Branch Line was re-opened between Parson Street Junction (Bristol) and Portbury Dock Junction (Pill) to freight trains serving Royal Portbury Dock. The major impacts arising from its construction including the substantial earthworks to create the railway alignment occurred in the 1860s.

9.3.2 There is evidence that an alternative alignment option was considered in the 1840s, further inland to the southwest of the Avon Gorge. A scheme promoted by Brunel secured Parliamentary powers. However, this alignment entailed a severely adverse gradient and long tunnel due to the surrounding topographical and landscape constraints and had technological constraints. Conventional stream trains did not have sufficient traction to traverse such an adverse gradient and an experimental 'atmospheric' form of traction was proposed. However, this form of traction was shown to be flawed when introduced between Exeter and Torbay by Brunel. The proposals for this alternative alignment between Bristol and Portishead did not subsequently achieve sufficient financial backing and the powers were abandoned. The alignment via the Avon Gorge was then progressed, authorised and built pursuant to the Portishead Pier and Railway Act 1863, amended by a subsequent Act in 1866.

9.3.3 Today the railway (the Portbury Freight Line) is an underused strategic transport corridor, being used only for freight trains. The option to build an entirely new railway alignment would necessitate the significant dislocation of existing communities as a result of needing to acquire and demolish dwellings, business premises and infrastructure. Not

only would there be a need for extensive demolition and land clearance, but alternative dwellings and business premises would need to be provided and infrastructure re aligned. Significant earthworks would be needed to create a gradient meeting modern technical standards because the north of the scheme is bounded by the River Avon and the south of the scheme by a broad ridge of higher land that extends from Clevedon, along Tickenham Ridge and through Failand. The areas of habitation to be served by the DCO Scheme could not be served by rail as effectively as the DCO Scheme, not least because the pattern of housing and commercial development along the Portishead to Bristol transport corridor was substantially constructed around the alignment of the route of the DCO Scheme. The sub region already faces the challenges of population growth and finite land capacity. The need to create a new railway alignment to serve populations that have grown up largely around existing alignment of the route of the DCO Scheme would place considerable additional development pressure on the sub region as there would be a need to build additional houses and business premises to accommodate those displaced from any alternative railway alignment. Apart from the economic costs of such a different railway alignment, the socio-economic and environmental costs would be of such magnitude that no alternative alignment could be feasible.

9.3.4 The rough order costs of creating a new railway alignment are in the order of £25M to £50M per kilometre. Based on an alignment length of approximately 15 kilometres this would result in a scheme capital cost of between £375M to £750M and unknown environmental impacts. By contrast the estimated capital cost of the Portishead Branch Line DCO Scheme is approximately £111M and has a benefit to cost ratio of 2.1:1, i.e. £2.10 of quantified benefits for every £1 invested to deliver the scheme. Benefit to cost ratios above 2:1 fall into the DfT's 'high value for money' category.

9.3.5 Taking the lower end of the estimated cost of a new railway alignment of £375M, the benefit to cost ratio would be around 0.62:1, i.e. the quantified benefits would be less than the estimated cost. Benefit to cost ratios of less than 1:1, fall into the DfT's 'poor value for money' category and this would mean there is no economic case for its delivery.

9.3.6 not Notwithstanding the scale of the non-economic impacts, the costs of simply constructing a new railway alignment are prohibitive and present no economic case for delivery.

9.3.7 In summary, for compelling geographic, topographical, technological, social, environmental and economic reasons, there is no viable alternative railway alignment outside the SAC that can be identified as a credible alternative solution to the DCO Scheme.

9.4 The Service Frequency Selection

9.4.1 The Preliminary Business Case (2014) tested the economic and financial performance of a range of train service frequency options, based on estimated capital and operational costs and the respective passenger demand and forecast revenue.

(https://metrowestphase1.files.wordpress.com/2017/10/phase-1-preliminary-business-case-sept-2014.pdf). This work was based on GRIP stage 1 and 2 feasibility undertaken by NR in 2014. The Preliminary Business Case identified that a half hourly / two trains per hour train service frequency for the whole MetroWest Phase 1 scheme including the Portishead Branch Line performed best in respect of value for money. From 2015 to 2017 the team promoting the scheme undertook GRIP stage 3 Option Selection. During this work the technical scope of the works required to upgrade the Portbury Freight Line to for passenger trains and achieve the required line speed, increased significantly. Furthermore, the scope of highway work also increased significantly, due to a need to provide an alternative access for the Ashton Vale Road industrial estate at the southern end of the existing freight line, as a result of the increased cycles and duration of down time of the level crossing barriers. In March 2017, the estimated cost of the scheme increased dramatically to £145M to £175M and was reported to the WoE Joint Transport Board. This gave rise to major affordability issues for the scheme and the Board decided to take a staged approach to the delivery of the scheme:

- Stage A deliver the service improvements to the Severn Beach and Bath corridors
- Stage B deliver an initial passenger train service to Portishead
- Stage C deliver the full two trains per hour passenger service to Portishead at a later date.

9.4.2 Value engineering work was undertaken for an initial passenger train service to Portishead (Stage B) in summer 2017. This identified that an hourly or an "hourly plus" passenger train service could be achieved using one train set operating as a shuttle service between Portishead and Bristol Temple Meads (previously the Portishead Line was going to operate as a through service to Severn Beach). This proposal entailed operating either; 18 passenger trains in each direction per day, for the hourly service; or 20 passenger trains in each direction per day including an additional train in the morning and even peak, for the hourly plus service. This revised option is referred to in scheme technical documents as the one train per hour (“1TPH”) scheme. No changes to Stage A (Severn Beach and Bath corridors) were made.

9.4.3 The proposals for Stage A (Severn Beach and Bath corridors) and Stage B (Portishead 1 TPH) were reported to the WoE Joint Committee (which superseded the WoE Joint Transport Board) and were developed further in the scheme Outline Business Case. The Outline Business Case was endorsed by the WoE Joint Committee in December 2017.

9.4.4 While there remains an aspiration to ultimately deliver Stage C - the full two trains per hour passenger service to Portishead, this will have to be taken forward as a separate scheme, with separate funding, business case and formal processes / consents. Stage C would entail additional double tracking through Bower Ashton with a new junction within the proximity of below the Clifton Suspension Bridge. In addition the closure of the Ashton Junction (Ashton Vale Road) highway level

crossing and an alternative highway link into Ashton Vale Road industrial estate would be required. There would also be a need for railway engineering works through the Avon Gorge that would require HRA under the Habitats Regulations. These works would most likely trigger a need for a Transport & Works Act Order. The option that is now proposed (the DCO Scheme) is therefore the optimum at this time and for the foreseeable future.

9.5 The opportunities to avoid or have a lesser effect on the European Site

9.5.1 The revision of the scheme from two trains per hour to one train per hour means there is less of an impact on Avon Gorge SAC arising from the DCO Scheme. This is because the one train per hour scheme does not require any changes in line speed, which means the existing track alignment can stay on its current alignment and track slewing (moving horizontally and vertically) is limited to a few centimetres only. This means much less vegetation must be cleared and fewer protected species are affected by the NR 3 m vegetation cess clearance either side of the railway track, compared with the original two trains per hour proposal.

9.5.2 As a result of maintaining the current track alignment and line speed, the load bearing on bridges and retaining walls has reduced, compared to the two trains per hour scheme. This means the scope of works to retaining walls and structures has been reduced, which in turn has reduced the scope of vegetation management works throughout the Avon Gorge SAC. Furthermore, the one train per hour scheme no longer includes a new railway junction south of Clifton Tunnel No 1 and associated double tracking works, at the southern tip of the SAC. Some fencing has been de-scoped for the one train per hour scheme and this has reduced the amount of vegetation clearance initially envisaged at earlier stages of the project design evolution.

9.5.3 During GRIP 5 detailed design and through into construction there will be further opportunities to reduce impacts on the SAC in respect of siting the precise location of the following elements of works to avoid qualifying habitats where this is practically achievable. These works include replacement of the railway fencing, installation of geo-tech catch fencing and rock dowels, installation of line side equipment such as signalling and communications equipment. For the purposes of this HRA Report at this stage of the assessment process a highly precautionary approach has been taken in which all potential impacts are assumed even though it is considered likely that micro-siting and detailed consideration of each whitebeam tree and area of works will enable the actual impacts to be reduced.

9.6 Do Nothing / No Scheme

9.6.1 Without the DCO Scheme the long term trend of continued traffic growth along the Portishead to Bristol corridor would continue. As congestion increases along the corridor further, journey times would continue to increase and journey time reliability would also continue worsen. This, together with the lack of a major alternative mode to the

car, would constrain access to employment, education and leisure for residents and business, leading to suppression of the sub-regional economy. Aligned with this comes less quantifiable harms to human health and the environment, which are evaluated in greater detail in section 10. The continued dependency on the car as the major mode of transport for the corridor would also continue to result in impacts on human health and public safety, which is set out further in HRA Stage 4 – Assessment of IROPI, and constrain the local authorities in their abilities to address air quality issues.

9.6.2 As set out above in the section regarding mode selection, the average speed by car from Portishead town centre to Bristol city centre is around 12 mph during the morning peak with a journey time of 50 minutes for the 9 miles (15 kilometre) distance. The A369 and surrounding highway network suffers from a lack of network resilience, unreliable journey times. This is caused by traffic congestion at both ends of the corridor, with junction 19 of the M5 at junction 19 at the western end and Bristol city centre at the eastern end.

9.6.3 Without the DCO Scheme alternative modes of travel would remain unavailable at times of disruption to the A369 which would continue to impact significantly on travel times as a result of incidents and accidents on the M5. Worsening journey time reliability would continue with consequent increased impacts on human health and public safety. Without the DCO Scheme the impacts on business would continue as a result of the poor journey times, reliability and congestion spread into the labour market and place extra costs on business due to increased operating costs of vehicles, more non-productive time spent travelling and wider productivity impacts from the reduction in the potential for business clustering.

9.6.4 Without the DCO Scheme none of the scheme benefits, listed in the HRA Stage 4 Assessment of IROPI at paragraph 10.5, would be realised.

9.6.5 The re-opening of the Portishead Branch Line as part of MetroWest Phase 1 (The Do Something Scenario) is assumed as a committed scheme within the base case for the Joint Spatial Plan (“JSP”) that sets out sustainable regional growth for the region to 2036. The scheme was also assumed as part of the base case for the Joint Transport Study (“JTS”) which informed the JSP. For land use and transport planning purposes, the sub-region is effectively assuming that MetroWest Phase 1 and 2 will be delivered early in the planning horizon. MetroWest Phase 1 supports the delivery of existing and the future needs of 105,000 new homes and 82,500 new jobs, set out in the JSP. Without MetroWest Phase 1 there would be adverse impacts on these JSP outputs.

9.6.6 In the draft JLTP4 MetroWest Phase 1 is cited as an early investment scheme in progress (a committed project) and is cited under policy W1 Provide more public transport options and improve service quality. Without MetroWest Phase 1 less transport options would be available particularly for the residents of Portishead and Pill and improved service quality would not be delivered.

9.6.7 In summary the no scheme scenario would result in adverse impacts in terms of increasing traffic congestion and journey times and worsening journey time reliability, leading to suppression of the sub-regional economy. See the Outline Business Case, December 2017 for more information. The continued dependency on the car as the major mode of transport for the corridor would also continue to result in impacts on human health and public safety. Further, the gains in terms of human health and the environment, identified as overriding public interest in Section 10, would not be achieved. The human health, public safety and environmental benefits of the DCO Scheme are set out further in HRA Stage 4 – Assessment of IROPI. The sub-region's strategy for the delivery of major housing development up to 2036 would also be adversely affected.

9.7 Summary

9.7.1 The evaluation of alternatives to the DCO Scheme has been undertaken over an extensive period of time and in considerable detail. All possible alternatives, from transport mode through railway alignment through train service frequency and opportunities to avoid or have a lesser effect on the European Site have been identified, evaluated and discounted. For the reasons set out in this HRA Report, the absence of alternative solutions to the DCO Scheme has been demonstrated. In conclusion, Test 3, absence of alternative solutions, has been satisfied as no possible, less-damaging alternatives to the DCO Scheme have been identified that would meet the Scheme objectives with any lesser effect on the integrity of the Avon Gorge Woodlands SAC. As explained in this HRA Report, no feasible alternatives to the DCO Scheme have been identified.

SECTION 10

Imperative Reasons of Overriding Public Interest

10.1 Introduction

10.1.1 Where the SoS is satisfied that there are no alternative solutions to the DCO Scheme, consideration should be given to whether the project must be carried out for IROPI. Regulation 64(1) of the Habitats Regulations states that IROPI may be of a social or economic nature unless the site concerned hosts a priority natural habitat type or a priority species, in which case the reasons must be either:

- reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or
- any other reasons which the competent authority, having due regard to the opinion of the European Commission, considers to be IROPI.

10.1.2 As the Avon Gorge Woodlands SAC hosts a priority natural habitat, the IROPI to be considered are those of human health, public safety or beneficial consequences of primary importance to the environment, in the first instance. The features of the SAC that adverse effects have been identified in respect of comprise 0.73 ha of a priority natural habitat type, being *Tilio-Acerion woodland*.

10.1.3 The impacts on 0.07 ha of *Festuco-Brometelia* grassland, which is not a priority natural habitat type, have been considered in relation to social or economic issues.

10.1.4 According to the European Commission Guidance on Managing Natura 2000 sites, published in November 2018, the SoS will need to conclude that the balance of interest between the conservation objectives of the Avon Gorge Woodlands SAC affected by the DCO Scheme and the IROPI weigh in favour of the grant of consent on the basis of IROPI. The Commission Guidance advises that IROPI should be determined according to the following considerations:

- There must be an imperative reason for implementing the DCO Scheme;
- The public interest must be overriding; and
- The public interest can only be overriding if it is a long-term interest.

10.1.5 The Commission Guidance advises that it is reasonable to consider that the "*imperative reasons of overriding public interest, including those of a social and economic nature*" refers to situations where plans or projects envisaged prove to be indispensable:

- Within the framework of actions or policies aiming to protect fundamental values for the citizens' life (health, safety, the environment);

- Within the framework of fundamental policies for the State and the society;
- Within the framework of carrying out activities of an economic or social nature, fulfilling specific obligations of public service.

10.1.6 It is for the competent authorities to weigh up the imperative reasons of overriding public interest of the plan or project against the objective of conserving natural habitats and wild fauna and flora. They can only approve the plan or project if the imperative reasons for the plan or project outweigh its impact on the conservation objectives.

10.1.7 As the Avon Gorge Woodlands SAC hosts a priority natural habitat type the IROPI considerations cannot include those of a social or economic nature in relation to this habitat. Accordingly, although the undertaking of the project by the consortium of local authorities in order to deliver public good and the objectives identified for the project are considered to meet the criteria that relates to the fulfilling of specific obligations of public service by carrying out activities of an economic or social nature, this does not fall to be taken into account by the SoS in determining IROPI in relation to priority natural habitat for the DCO Scheme.

10.2 Imperative reasons of overriding public interest

10.2.1 The Portishead to Bristol transport corridor has serious long term transport problems and intervention is urgently needed to address these problems and to avoid worsening impacts on public safety, human health and the environment. The 15 km corridor has very limited mode choices, the main modes are road based, by car, bus and taxi. While walking and cycling are increasing for local journeys under 2 km, they are not viable options for journeys of 14 km, for the vast majority of the population. Journey to work data from the 2011 census demonstrates the extent of car dependency on the corridor, in comparison with the national average. Table 10.1 presents a breakdown of modes of travel to work across the local, regional and national scale.

Table 10.1. Methods of travel to work for the Portishead corridor, and at regional and national scales (Census, 2011)

Method of Travel to Work (QS701EW)	Portishead corridor		North Somerset		West of England		South West		England	
All Usual Residents Aged 16 to 74	28,838		145,352		789,876		3,856,715		38,881,374	
Work Mainly at or From Home	1,590	7.8%	6,422	6.6%	28,991	5.5%	177,999	7.0%	1,349,568	5.4%
Underground, Metro, Light Rail, Tram	44	0.2%	102	0.1%	610	0.1%	3,086	0.1%	1,027,625	4.1%
Train	194	1.0%	2,339	2.4%	11,264	2.1%	38,898	1.5%	1,343,684	5.3%
Bus, Minibus or Coach	621	3.1%	2,941	3.0%	35,372	6.7%	119,878	4.7%	1,886,539	7.5%
Taxi	23	0.1%	366	0.4%	1,468	0.3%	7,493	0.3%	131,465	0.5%
Motorcycle, Scooter or Moped	204	1.0%	975	1.0%	6,147	1.2%	28,461	1.1%	206,550	0.8%
Driving a Car or Van	14,647	71.9%	66,826	68.5%	313,864	59.3%	1,596,171	62.3%	14,345,882	57.0%
Passenger in a Car or Van	922	4.5%	5,115	5.2%	26,187	5.0%	132,014	5.2%	1,264,553	5.0%
Bicycle	574	2.8%	2,692	2.8%	26,796	5.1%	90,285	3.5%	742,675	3.0%
On Foot	1,430	7.0%	9,249	9.5%	75,446	14.3%	348,463	13.6%	2,701,453	10.7%
Other Method of Travel to Work	109	0.5%	536	0.5%	2,802	0.5%	17,636	0.7%	162,727	0.6%
Not in employment	8,480	not incl	47,789	not incl	260,929	not incl	1,296,331	not incl	13,718,653	not incl

10.2.2 As reflected in the census data the car is the main choice for journeys on the corridor. Furthermore, the mode choices (bus and taxi) for the corridor are highway modes which have to use the A369 and are constrained by highway traffic congestion.

10.2.3 As summarised in the Transport Assessment (TA) (Appendix 16.1, DCO Document Reference 6.25) the highway network surrounding Portishead and between Portishead and Bristol (A369) is dominated by the M5 and this causes very poor network resilience. A major issue is the A369 is dissected by the M5 at Junction 19. Furthermore Junction 19 to Junction 18 is the Avonmouth Bridge which is a well known hot spot on the strategic road network in respect of traffic delays, accidents and incidents. As a result traffic is diverted off the M5 at junction 19 onto the local highway network (A369) in unpredictable occurrences, causing the A369 to become overwhelmed with traffic saturation, resulting in long delays, disruption to people and business and wide spread negative impacts. In practical terms, Portishead effectively regularly becomes cut off from Bristol for durations of several hours as the A369 is saturated and traffic on other indirect routes also becomes saturated. Figure 10.1 below shows how the M5 relates to the A369 and the fundamental problem of very poor network resilience.

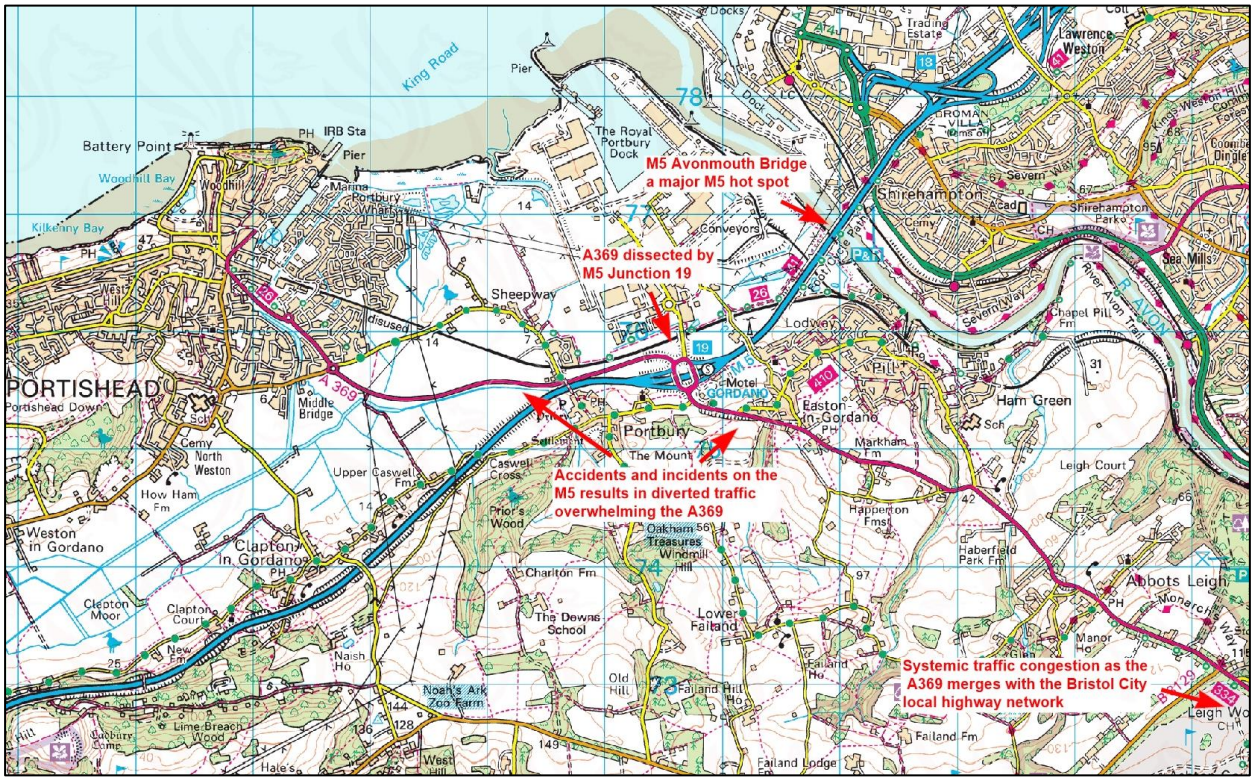


Figure 10.1. Transport Network

10.2.4 The delays and disruption on the A369 caused by accidents and incidents on the M5, are exacerbated further by systematic congestion at the eastern end of the A369 as it merges with the Bristol City highway network. Consequently, the volume of traffic is greater than the capacity of the highway resulting in prolonged queue lengths. The prolonged queuing takes time to ease and this results in a very poor average speed for the corridor of approximately 12 mph during the morning peak with a journey

time of 50 minutes for the 10 miles (16 kilometre) distance reported in the TA.

10.2.5 The DCO Scheme will tackle car dependency and will result in substantial modal shift as follows:

- 377,000 passenger train trips from Portishead and Pill stations in the opening year
- a reduction of 133,000 car trips in the opening year
- a reduction of 3.9M car kilometres the opening year.

10.2.6 The DCO Scheme will provide a journey time to Bristol of 23 minutes which is less than half the current journey time by car in the AM peak (see table 9.1 in section 9.2 of the Assessment of Alternatives). This step change in journey time will counter the long term trend of car dependency for the corridor. The DCO Scheme has wide ranging quantified benefits which are set out in the MetroWest Phase 1 Outline Business Case ("OBC"). Chapter 2 the Economic Case sets out in detail the transport modelling undertaken and associated economic appraisal in accordance with DfT's technical guidance WebTAG. A summary of the quantified benefits is set out in the table below.

Table 10.2. MetroWest Phase 1 & DCO Scheme Summary of Quantified Benefits

Description	Whole of MetroWest Phase 1 Severn Beach Line, Bath Spa Line & Portishead Line	Portishead Line (DCO Scheme)
Modal Shift	Reduction of 580 car trips per day in the opening year, increasing to 890 less car trips per day by 2036	Reduction of 294 car trips per day in the opening year, increasing to 415 less car trips per day by 2036
Car Use	Reduction of 7,552,018 car kilometres in the opening year	Reduction of 3.9M pcu-km car kilometres in the opening year
Air Quality & Greenhouse Gases	Reduction of 7100 tonnes of CO_2 over 60 years	N/A- The traffic model can't isolate these benefits for the DCO Scheme
Reduction in Road Traffic Accidents	A reduction of 130 accidents over the appraisal period resulting in £5,845,450 of benefits to society	N/A- The traffic model can't isolate these benefits for the DCO Scheme
Job Creation	514 net new direct permanent jobs + temporary jobs during construction	207 net new direct permanent jobs + temporary jobs during construction

Table 10.2. MetroWest Phase 1 & DCO Scheme Summary of Quantified Benefits

Description	Whole of MetroWest Phase 1 Severn Beach Line, Bath Spa Line & Portishead Line	Portishead Line (DCO Scheme)
Gross Value Added ("GVA") to the economy	£31.87M PA in the opening year, totalling £271M discounted GVA during the first 10 years. Plus a further £59.27M during construction	£12.95M PA in the opening year, totalling £139M discounted GVA during the first 10 years. Plus a further £54.78M during construction
Forecast Rail Passenger demand & number of train sets	2021: 958,980 passenger trips 2036: 1,295,103 passenger trips 6 train sets (including 2 existing train sets on the Severn Beach Line)	2021: 377,021 passenger trips 2036: 509,167 passenger trips 1 train set
Population Benefiting	Will upgrade the existing train service at 16 existing stations across three rail corridors, directly benefiting 180,000 people within a 1km catchment and bring an additional 50,000 people within the catchment of the 2 new stations. The total population benefiting from the project is 230,000.	Will bring an additional 50,000 people within the immediate catchment of the 2 new stations at Portishead and Pill

10.2.7 The DCO Scheme will enhance social wellbeing through improved equality of access to employment, health facilities, education and leisure, particularly for young people, economically disadvantaged people and elderly people. In addition to the quantified benefits the DCO Scheme will deliver wide ranging unquantifiable social wellbeing benefits, across the whole local demographic. Further information about the socio-economic effects of the DCO Scheme, including the net benefits, is set out in the Outline Business Case for MetroWest Phase 1, December 2017 and Chapter 14 Socio-Economics and Economic Regeneration of the ES (DCO Document Reference 6.17).

10.2.8 Without the DCO Scheme the disruption to the A369 would continue as a result of incidents and accidents on the M5, with motorists diverted onto the A369 at junction 19, resulting in worsening journey time reliability and a reduction in average vehicle speeds of 5% by 2036 (MetroWest Phase 1, OBC, Chapter 2 Economic Case, Appendix 2.1 Forecasting report, Section 4.2). Furthermore, without the DCO Scheme the rate of the growth of traffic

congestion would be greater than with the implementation of the scheme. This worsening of journey time reliability and the continuation of the current rate of growth of traffic congestion would have direct increased impacts on human health and public safety. If unaddressed these impacts over the long term would be wide ranging and substantial and would directly impact over 50,000 local residents. It is within this context that there is a clear case of IROPI for the DCO Scheme to be implemented. The imperative reasons are explained in detail in the following sections of this assessment.

10.2.9 Having established that the DCO Scheme is capable of meeting the tests of a public and overriding interest, this HRA Stage 4 Assessment of IROPI considers these in terms of human health, public safety and overriding environmental benefit for priority habitat and socio-economic benefits relating to non priority habitat.

10.3 Public Safety

10.3.1 There are three main aspects for imperative reasons relating to public safety' emergency services public safety, mode public safety and Portishead Line Public Safety.

Emergency Services Public Safety

10.3.2 Without the implementation of the DCO Scheme the worsening of journey time reliability, a reduction in average vehicle speeds of 5% by 2036 and the continuation of the current rate of growth of traffic congestion reported in Chapter 2, the Economic Case of the OBC and TA would have direct increased impacts on public safety. The volume of traffic on sections of the A369 is already beyond the capacity of the highway which results in prolonged traffic queueing, at both ends of the corridor. The DCO Scheme will take 294 cars off the road per day in the opening year, increasing to 415 per day by 2036. The DCO Scheme will also result in a reduction of 3.9 M car kilometres in the opening year. This will directly improve public improving response times for the emergency services.

10.3.3 The highway network surrounding Portishead and between Portishead and Bristol (A369) is dominated by the M5 and this causes very poor network resilience. A major issue is the A369 is dissected by the M5 at Junction 19, as discussed in section 10.2.3. The impact of the existing traffic congestion and the unreliable journey times on the A369 on the response times for blue light emergency services is a major cause of concern and will worsen if the scheme is not delivered. Saving just a few minutes to arrive at the scene of an emergency could also be the difference between life or death for members of the public. Although it is not possible to quantify the number of lives that could be saved or the number of people with improved long term heath as a result of the implementation of the DCO Scheme due to improved emergency response times, the main impacts for each of the emergency services have been set out quantitatively, as follows.

Emergency Response by the Police

10.3.4 The police routinely respond to emergency incidents of violent crime. Getting to the scene of the incident as rapidly as possible can have a major influence on the outcome for the individual and the apprehension of the perpetrators. For example, arriving at the scene a few minutes later than

what would be achievable with the implementation of the scheme, could mean the injuries to the victim are worse than what they would have been or could mean the perpetrators are not apprehended. In some situations this could be the difference between life and death for the victim.

Emergency Response by the Ambulance Service

10.3.5 The Ambulance Service routinely respond to emergency incidents across the area and getting to the incident as rapidly as possible can have a major influence on the outcome for the individual. For example, arriving at the scene a few minutes later than what would be achievable with the implementation of the scheme, could mean the paramedics are unable to resuscitate someone who has had a heart attack, or a stroke. As a result the outcome for the individual is much more serious entailing dramatic impairments to their personal health and mobility. In some situations this could be the difference between life and death for the individual.

Emergency Response by the Fire & Rescue Service and the Coast Guard

10.3.6 The Fire & Rescue Service and the Coast Guard routinely respond to emergency incidents across the area and getting to the incident as rapidly as possible can have a major influence on the outcome for the individual. For example, arriving at the scene of a house fire or at the scene of a road vehicle accident or at the scene of an incident on the coast line a few minutes later than what would be achievable with the implementation of the scheme, could mean the difference between life and death or serious long term impairments to the individuals personal health and mobility.

Mode Public Safety

10.3.7 Train travel is nine times safer than road travel according to the Rail Safety and Standards Board (BBC, 2004). The tables below demonstrate how safe trains are compared to roads. In the ten year period from 2007/08 to 2017/18 there have been no passengers killed in train accidents. In comparison every year thousands of people are killed in road accidents and tens of thousands are seriously injured. In 2016, there were 1,792 fatalities and 24,101 people seriously injured in road accidents.

10.3.8 The tables below demonstrate how travelling by train is much safer than travelling by road.

Table 10.3. Road Accident Statistics 2016

Vehicle kms Per Year	518.4 Billion
Fatalities	1,792
Seriously Injured	24,101
Slightly Injured	155,491

(DfT, 2017)

Table 10.4. Rail Accident Statistics 2016

Vehicle kms Per Year	66 Billion
Suicides	237
Non-suicide fatalities	39
Passengers killed in train accidents	0

(DfT, 2017)

10.3.9 The reduction of 7,552,018 pcu-km car kilometres arising from the wider MetroWest Phase 1 project results in a reduction of 130 accidents over the 60 year scheme appraisal period resulting in £5,845,450 of quantified benefits to society. Of the 130 accidents savings in the appraisal period, there would be 175 fewer casualties (1 fatal, 16 serious and 158 slight) as reported in Chapter 2, the Economic Case of the OBC.

Portishead Line Public Safety

10.3.10 The works required in the Avon Gorge are not part of the NSIP but form Associated Development. The justification for the works is public safety in relation to the safety of the public, the safety of rail industry employees and safety of rail passengers.

10.3.11 Specific safety related works are required in the Avon Gorge which broadly relate to works to deter trespass on the railway (to keep the public safe) and works to protect the railway (to keep rail industry employees and rail passengers safe). These safety works are determined by railway national standards and in particular standards for upgrading freight railway to passenger and freight use.

10.3.12 The works in the Avon Gorge that affect the qualifying habitats of the SAC include replacement of the railway fencing, installation of geo-technical catch fences, rock dowels to stabilise rock in situ and rock block removal, and installation of line side equipment such as signalling and communications equipment. The works are needed to upgrade the existing freight line to a passenger and freight line. The upgrade will mean that the line will be reclassified from NR's track category 5 to track category 4 and the re-introduction of passenger trains necessitates meeting railway engineering standards and safety requirements.

10.3.13 In the Avon Gorge Woodlands SAC paladin fences are being proposed to replace the current post and wire fences, which are a trespass risk to the line. Trespass can lead to fatal accidents if not prevented. A 1 m width of vegetation is required to be cut either side of the proposed fence line for installation and this will be allowed to regrow. The proposed fence line installation will also prevent trespass to the inland side of the railway and damage to the SAC. There have been instances of this and the current post and wire fencing does not sufficiently deter trespass. The improved standard of fencing required for the DCO Scheme arises from the change in classification to track category 4. Trespass poses a rise to trespassers, to train drivers, to engineering and maintenance staff and to passengers on trains that may be derailed or otherwise involved in an incident arising from the presence of a trespasser. The fencing proposed as associated

development as part of the DCO Scheme has been designed to balance the safety requirements of the rail operator with minimising environmental impacts.

10.3.14 Vegetation clearance is required around structures to allow repair work as presented in section 8.3.4. This comprises:

- 1 m either side of wing walls and 5 m from the bridge arch work is proposed to seven bridges.
- Vegetation clearance 5 m around Quarry Bridge No. 2 either side along the rail and along the embankment.
- Quarry Bridge No. 2 site compound. A temporary ramp from the freight line to Quarry 2 with an associated site compound area is proposed for the construction works to Quarry Bridge No. 2. The methodology for the bridge replacement and location of the site compound is included in ES Appendix 9.11 AGVMP Ver. 02 Annex C (DCO Document Reference 8.12).
- Local rebuild of Retaining Walls at 122mi 67ch and at 122mi 79ch. Vegetation clearance on 2 m of wall to rebuild and 2 m either side of wall plus 2 m either side to tie-in (10 m in total at each retaining wall).

10.3.15 The locations of the works are discussed fully in the AGVMP Ver. 02 in the ES Volume 4 Appendix 9.11 (DCO Document Reference 8.12). The vegetation will be allowed to regrow following the work. If the structures repairs were not carried out as part of this scheme it is likely that some of the works would have to be undertaken in the future as part of the maintenance programme for the freight line.

10.3.16 A vegetation cut is required for geo-technical works in the Avon Gorge to the cliff faces, these are detailed in the AGVMP Ver. 02 DCO Document Reference 8.12). Some trees including whitebeam are also being removed for safety reasons as they are too close to the line or are unstable. As above these works are required for passenger safety and the changing track category.

10.4 Human Health

10.4.1 Without the implementation of the DCO Scheme the worsening of journey time reliability and the continuation of the current rate of growth of traffic congestion would have direct increased impacts on human health. The volume of traffic on sections of the A369 is already beyond the capacity of the highway which results in prolonged traffic queueing, at both ends of the corridor. As shown in table 10.2 the DCO Scheme will take 294 cars off the road per day in the opening year, increasing to 415 per day by 2036. The DCO Scheme will also result in a reduction of 3.9M car kilometres in the opening year and provide a 23 minute journey time from Portishead to Bristol. 50,000 additional people would be in the catchment area of the two new stations.

10.4.2 The human health effects that can be identified as arising directly from the DCO Scheme in terms of modal shift and accessibility and the reduction of emissions per passenger kilometre air quality are presented below.

Air Quality

10.4.3 Modal shift away from the car and therefore reducing car use is the single most effective way in which the local authorities can tackle air quality imperatives. The draft JLTP4 2019-36 has an objective to address poor air quality and take action against climate change with the following outcomes. The new train services promoted as part of the wider MetroWest programme has an important function in contributing to this policy, reducing emissions per passenger kilometre travelled compared with equivalent road transport as reported in section 7.10 of Chapter 7 Air Quality.

10.4.4 The DCO Scheme will make a contribution towards an improvement in Air Quality and Green House Gas emissions as part of the integrated transport network (draft JLTP4) which will result in a decrease in car use across the region. The draft JLTP4, states “To provide realistic and attractive alternatives to the private car, a fully integrated public transport network will be developed. This includes improvements to the bus network, an expanded MetroBus network, new Park & Ride sites and enhanced rail services.” The DCO Scheme integrates with other MetroWest services at Temple Meads and with the MetroBus network. This enables public transport access across the city and onwards to the wider WoE region, providing a realistic alternative to the car thus reducing emissions.

10.4.5 The Air Quality Clean Air Zone for Bristol will also require projects such as MetroWest Phase 1 to be delivered to provide alternative travel choices into the city centre. This is because it will restrict the amount of diesel vehicles within the city centre to reach compliance with the EU’s NO_2 level limit in the shortest possible time. Two options are currently being consulted upon by BCC to take forward. Option 1 is expected to be compliant with Air Quality levels by 2029 and Option 2 by 2028. MetroWest Phase 1 will be open in Winter 2023/24, so will be able to offer an alternative transport option for when the air zone to comes into force. The options are detailed below.

Option 1 Clean Air Zone (private cars not charged)

10.4.6 A zone in which non-compliant (older, more polluting) buses, coaches, taxis, heavy goods vehicles (HGVs, i.e. goods vehicles over 3,500 kg) and light goods vehicles (LGVs, i.e. goods vehicles not exceeding 3,500 kg) would be charged a fixed sum for each day they are driven in the zone. One of the additional targeted measures include a part-time ban on all diesel cars on Upper Maudlin Street and Park Row (in front of the children’s hospital).

Option 2: Diesel car ban

10.4.7 Banning all diesel cars from driving in a specific central area from 7.00 am to 3.00 pm, seven days a week. This would encourage people to find different ways to travel, particularly for journeys to work which take place in the most congested morning ‘rush hour’. By encouraging drivers of diesel cars to leave them at home in the morning (when the ban is operating), this should also improve air quality in the evening ‘rush hour’ (after the ban), because those drivers would use less polluting transport to travel home.

Mode shift and Accessibility

10.4.8 The Outline Business Case, Chapter 14 Socio-economics and Economic Regeneration of the ES (DCO Document Reference 6.17), the Health

Impact Assessment (Appendix 14.2 of the ES, DCO Document Reference 6.25), the Equality Impact Assessment (Appendix 14.1 of the ES, DCO Document Reference 6.25) and Transport Assessment (TA) (Appendix 16.1, DCO Document Reference 6.25) form part of the DCO application. Information has been drawn on from these sources to present the case set out below.

10.4.9 The scheme has been designed to promote active travel to the stations. At Portishead a new boulevard will be created linking Portishead Station to the town centre and there are other new shared use paths to the station (DCO Document Reference 2.38). Both stations provide cycle parking and there are Outline Station Travel plans to both stations presented in Appendix M of the TA (Appendix 16.1, DCO Document Reference 6.25). Sustainable modes are particularly important for the shorter distance trips to and from the stations. The TA for the DCO scheme reports that the majority of people on a weekday are forecast to walk or cycle in the opening year; over 50% to both Portishead and Pill Stations. For active travel trips to the stations there will be positive health benefits from increased levels of exercise, as widely studied and reported. For example, higher levels of exercise contribute to reduced obesity and associated diseases such as diabetes and has positive impacts on mental health. The current WoE JLTP3 (West of England Partnership, 2011) supports the impacts the DCO scheme can have on health by reporting:

- 67% of adults in Bristol are at an increasing risk of ill health due to low levels of physical activity; physically active people reduce their risk of developing chronic diseases - such as coronary heart disease, stroke and type 2 diabetes - by up to 50%, and the risk of premature death reduces by about 20-30% (National Active Travel Strategy 2010).
- Walking and cycling are an easy way for many people to increase their physical activity levels.
- Each additional kilometre walked per day is associated with a 4.8% reduction in the likelihood of obesity. Each additional hour spent in a car per day is associated with a 6% increase.
- Increased public transport use contributes to increased physical activity.

10.4.10 Driving has been found to be the most stressful travel mode. One of the reasons is because drivers must budget a considerable amount of extra time to deal with unexpected delay and are more likely to be stressed when they are less satisfied with the time of their commute (Legrain, A., Eluru, N., & El-Geneidy, A, 2015). This is particularly relevant as there is poor journey time reliability on the A369 corridor, and it is susceptible to network disruption from incidents and accidents on the M5 as reported in the TA. This means that drivers need to give themselves extra time to deal with unexpected delay, and associated stresses which arise from being late to their destination such as to work or appointments. Driving can also require constant concentration, giving rise to boredom, social isolation and stress, which can cause negative health impacts affecting sleep among other things. Mode shift from cars to the train could reduce stress as the time

spent driving can be used for other purposes such as relaxation, reading or socialising.

10.4.11 ES Appendix 14.2 the Health Impact Assessment states that important community services can affect the health and well-being of the population, if services are not accessible, the health and well-being of the population may suffer.

10.4.12 A Social Exclusion Unit Report (Social Exclusion Unit, 2003) suggests that accessibility of transport modes and the location of health care affect the capacity of people to reach healthcare services. People of a certain age or with a disability may experience greater barriers to access healthcare services. The DCO scheme improves accessibility reducing this.

10.4.13 The DCO Scheme will lead to improved connectivity between Portishead, Pill, Bristol and the rest of the WoE. This provides better accessibility thus improving mental health from reduced social isolation. It will increase accessibility by providing a better and more reliable journey time to Bristol Temple Meads of 23 mins compared to the car and bus as noted in table 9.1. As discussed in the TA and OBC the worsening of journey time reliability and the continuation of the current rate of growth of traffic congestion would affect 50,000 people if the DCO Scheme did not go ahead. The HIA shows Pill particularly has a higher than the average number of people who are elderly who would benefit from improved public transport to Bristol and Portishead.

10.4.14 Deprivation itself is recognised as a key factor in health inequalities and in poorer outcomes for the less advantaged. The objectives of the DCO Scheme in terms of delivering accessibility from areas such as Pill to education and training destinations in Bristol, and providing an alternative to the car for residents unable to afford cars or who have impaired mobility, contribute to improved well-being, opportunities for aspiration and a means to promote reduction in inequality and exclusion.

10.4.15 Good physical health and social and psychological well-being have been linked to having a secure job (Marmot et al., 2010). Income is also important for health as it partly determines living standards and quality of life (Waddell and Burton, 2007). The OBC for the whole MetroWest Phase 1 project, states that 514 new permanent jobs will be created. This will reduce unemployment and is expected to have a positive impact on health and wellbeing.

10.5 Over-riding environmental benefit

Strategic Context

10.5.1 The DCO Scheme forms a key part of the wider MetroWest strategic programme, to enhance the reach and the service frequency of the local rail network. The MetroWest programme comprises:

- MetroWest Phase 1 to enhance the Severn Beach Line and the Bath Spa to Bristol Line to operate a half hourly train service and re-open the Portishead Line with an hourly train service. Two new stations are proposed, at Portishead and Pill. The new train services will also service 16 existing stations.

- MetroWest Phase 2 to enhance the Yate to Bristol Line to operate half hourly train service and introduce an hourly train service on the Henbury line (freight only) to Bristol. Three new stations are proposed at Henbury, North Filton and Ashley Down. The new train services will also serve six existing stations.
- Specific station re-opening / new station projects, including Portway station and Charfield station.

  Further enhancements to service frequency for local rail lines (currently at the feasibility stage).

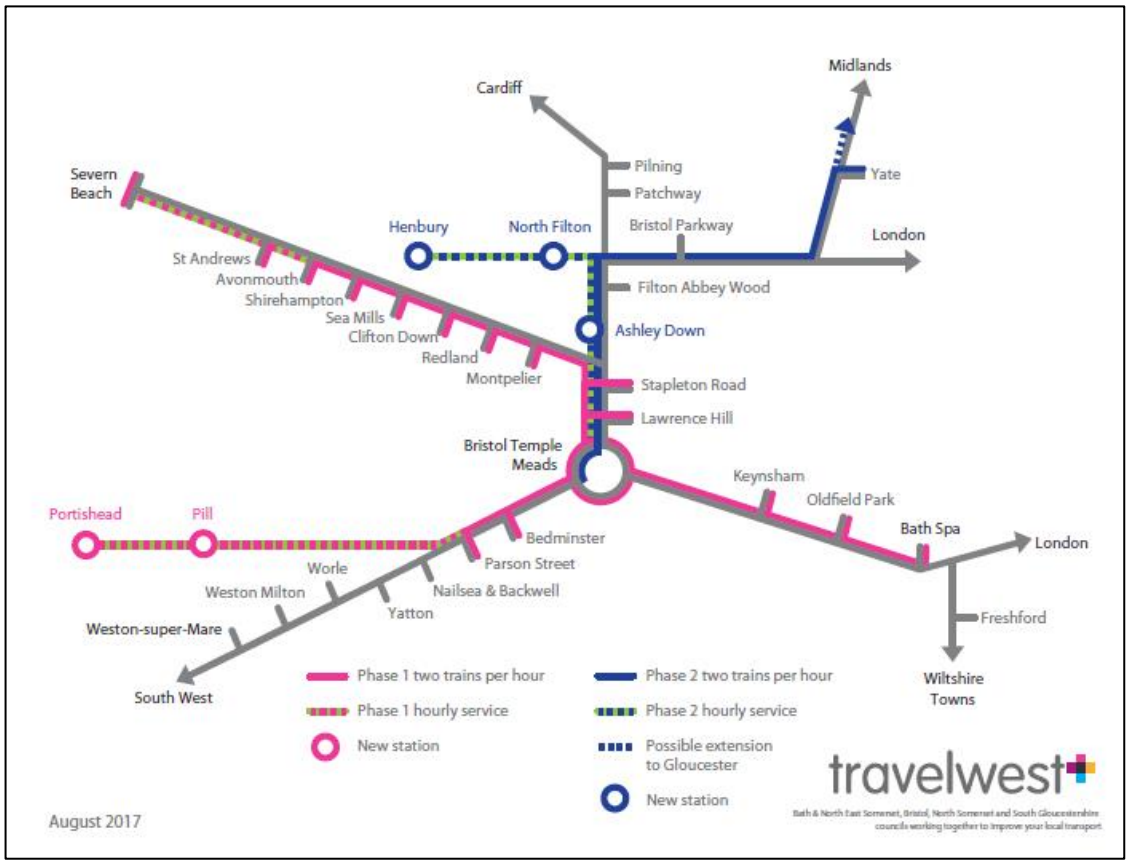


Figure 10.2 Diagrammatic Illustration of the MetroWest Programme

10.5.2 The first three projects of the MetroWest Programme (as above) are scheduled to be delivered by 2023 at an estimated cost of approximately £170M. The three projects will provide new/enhanced train services for about 500,000 people within 2 km of local stations served by the proposals. The programme is expected to be expanded further as part of the key priorities of the five authorities in delivering the draft Joint Local Transport Plan 4 (draft JLTP4) 2019 to 2036.

10.5.3 Draft JLTP4 Early Investment Schemes under initial consideration such as Stage C of MetroWest Phase 1 (a two trains per hour service on the Portishead Branch Line) and for a further new station to open at Ashton Gate on the Branch Line, require the DCO Scheme to go ahead. These additional schemes would support the delivery of new homes and economic development along the Portishead to Bristol corridor, including proposals for 520 homes at Ashton Gate. Consequently, the DCO Scheme (being the

major part of MetroWest Phase 1) provides the foundation upon which the rest of the MetroWest programme will be developed.

10.5.4 Therefore, the delivery of the DCO Scheme is strategically important for the five local authorities in delivering their transport policy objectives and realising strategic priorities (draft JLTP4). Furthermore, as the air quality, greenhouse gas and wider human health benefits of the individual components of the projects within the MetroWest programme are delivered and aggregated, the DCO Scheme will contribute to wider long term benefits.

New Mode of Transport for the Portishead to Bristol Corridor

10.5.5 The DCO Scheme will provide the infrastructure for a new mode of transport (since the cessation of passenger trains on the Portishead branch line in 1964) for the Portishead to Bristol corridor.

10.5.6 The DCO Scheme will provide substantial benefits which are summarised in Table 10.2. These benefits will increase into the future with the advent of emerging low emission technology replacing conventional diesel powered passenger trains as stated in section 1.8, Appendix 7.5 Climate (DCO Document Reference 6.25) of ES Chapter 7 Air Quality and Greenhouse Gases (DCO Document Reference 6.10). This technology is already beginning to come to market as follows.

10.5.7 Hybrid diesel / battery power systems reducing emissions by typically 20% compared to a standard EURO5 diesel powered new train, are now being offered to the market by Angel Trains and Porterbrook, as a conversion to existing diesel powered trains.

10.5.8 Tri-mode diesel / battery / electric trains manufactured by Stadler provide both a greater reduction in emissions while offering greater operational capability. The actual reduction in emissions depends upon the length of overhead line electrification in operation on the train route. The Welsh Government has placed an order for these trains for South Wales Valleys.

10.5.9 Hydrogen powered trains have been introduced into service in Germany, developed by Alstom. Also Porterbrook is currently developing hydrogen power systems to convert existing diesel or electric trains. Hydrogen is used to generate electricity which powers the electric motors. The only by product of hydrogen is water.

Tackling Car Dependency and Wider Environmental Benefits

10.5.10 Without the DCO Scheme the trend of car dependency will continue. Table 10.1 above shows that car dependency is a major issue on the Portishead corridor with 71.9% of all journey to work are by car/van, compared with 59.3% for the WoE and 57.0% for England. The DCO Scheme will assist the re-balancing of the local transport network, by addressing the very limited modal choice for the Portishead to Bristol corridor, which is reflected in the proportion of journeys to work taken by train. Just 1.0% of journeys to work on the Portishead corridor are by train, compared with 2.1% for the WoE and 5.3% for England.

10.5.11 The trend of car dependency is not limited to just car use, it translates into higher levels car ownership. Analysis of census journey to work data for the Portishead station catchment area of 2km compared with a 2km catchment

of similar towns with an existing station providing a 1 train per hour service, is shown in table 10.5. Analysis of census data has also been undertaken to compare car ownership data for Portishead station catchment with that of similar existing stations with a 1 train per hour service, see table 10.6.

Table 10.5 Commuting Modes Used (2011 Census – all catchments approx. 2km, based on Lower Super Output Areas (LSOAs)

Method of Travel to Work (QS701EW)	**Portishead Station Catchment**	**Benchmark stations with 1 train per hour (some stations have more services in the peak)**
Train	0.7%	3.1%
Driving a Car or Van	79.2%	68.3%

Table 10.6 Car/van Ownership *(2011 Census – all catchments approx. 2km, based on LSOAs)*

Car Ownership	**Portishead Station Catchment**	**Benchmark stations with 1 train per hour (some stations have more services in the peak)**
No car households	12.7%	20.0%
1 car households	41.2%	44.3%
2 or more car households	46.1%	35.7%
Cars/vans per household	1.44	1.27

10.5.12 The analysis of census data for the Portishead station catchment with the catchment of similar existing stations with a 1 train per hour service, shows the proportion of journeys to work by train is 0.7% and 3.1%, respectively, as shown in table 10.5. Table 10.5 also shows that where an hourly train service is provided the journeys to work by car/van are considerably lower, comprising 68% of journeys compared with 79% for Portishead (currently without a train station / service). This analysis is a more granular analysis of car use trends set out in section 10.5.9 and in table 10.1.

10.5.13 Table 10.6 shows the proportion of households with 1 car/van available is reasonably similar when comparing the Portishead catchment and the catchments of stations with 1 train per hour. However, the proportion of multi-car households is markedly higher in Portishead (46% compared to 36%) and the number of no-car households commensurately lower (13% versus 20%). Overall, the car ownership figures show that the number of cars/vans per household is around 13% higher in the Portishead catchment than catchments for other stations that have a similar level of service (1.44 cars/vans per household for Portishead compared to 1.27 at other stations).

10.5.14 The 1.27 cars/vans per household is an average of multiple comparable stations and therefore can be regarded as the current long term trend for similar towns with an existing station providing a 1 train per hour service. It can therefore be assumed that the rate of car/van ownership in the Portishead catchment will reduce to this lower level over time (as households decide whether to retain a second vehicle). The reduction to 1.27 cars/vans per household the Portishead catchment would result in approximately 1,500 fewer vehicles owned by households.

10.5.15 The reduction of 1,500 cars/van owned in Portishead would result in substantial long term environmental benefits. This is due to reduced environmental impacts of 1,500 less car/van being manufactured and used over an average life span and subsequently replaced with a new car/van, in a long term cycle of manufacture and use. Quantifying the whole-life environmental impacts of car/van manufacture and use over 60 years (the design life of the DCO Scheme) would be highly complex with a large number of variables and cannot practically be undertaken by the scheme promoter.

10.5.16 Consequently, there are wider environmental benefits resulting from the DCO Scheme, that cannot be readily quantified. Although it is not practical to quantify these benefits in terms of a total reduction in CO2, from removing 1,500 cars/vans off the road and off the national vehicle fleet long term, this positive environmental impact should be taken into account in determining the case for overriding imperative reasons for public interest.

Longer Term Transport Policy Decision Making

10.5.17 The implementation of the DCO Scheme will result is substantial over-riding environmental benefits. The DCO Scheme will assist the de-carbonisation of the local transport network as part of the medium to long term MetroWest Programme of investing in the local rail network, which forms a key foundation of the WoE's transport strategy (draft JLTP4), to achieve modal switch. Beyond the implementation of DCO Scheme local policy makers will have greater opportunity to implement more ambitious de-carbonisation / climate change policies, that target modal switch objectives, through some form of 'congestion charge' or 'road pricing' scheme. However, the pursuit of these more ambitious policies could not realistically be pursued for the Portishead to Bristol corridor without the implementation of the DCO Scheme.

10.6 Over-riding socio-economic benefit with regard to non-priority habitat only

10.6.1 There is 0.07 ha of *Festuco-Brometalia* grassland affected by the DCO Scheme. As this is non-priority habitat, socio-economic IROPI reasons can be applied. The case is based on the benefits presented in table 10.2, the OBC and Socio-Economic chapter. In respect of the 0.73 ha of *Tilio Acerion* woodland priority habitat affected by the DCO Scheme the socio-economic case below does not hold any weight under the legislation.

10.6.2 The benefit cost ratio for the whole of MetroWest Phase 1 is 3.61, which represents high value for money with £3.61 of quantified benefits for every £1 spent.

10.6.3 As stated earlier MetroWest Phase 1 will benefit 230,000 people and with 50,000 of these people directly benefiting from being able to travel by train with the two new stations at Portishead and Pill. It also provides improved train service provision for Parson Street and Bedminster stations, due to an additional train per hour, which would support the regeneration of south Bristol and improve the viability of development proposals adjacent to Bedminster station. This will increase the number of people living within 30 minutes travel time of key employment areas, such as Temple Quarter Enterprise Zone, potentially widening labour supply and demand catchments leading to higher labour participation and employment rates, improved productivity boosting local economic output, leading to increased investment and further job creation.

10.6.4 The Portishead Branch line will also create directly 207 permanent jobs, with temporary jobs created during construction. The Portishead branch line will create £12.95M per annum in the opening year totalling £139M discounted GVA during the first ten years. Plus a further £54.78M during construction.

10.6.5 The Portishead Branch Line will provide improved accessibility to sites for new homes and employment development in proximity to the rail corridors. Specifically supporting the delivery of the 105,000 new homes and 82,500 new jobs identified in the WoE JTS and WoE JSP. It will also increase land values and development viability along the corridor enabling further sustainable development and assist with unlocking development land.

10.6.6 Social benefits the DCO Scheme will include helping to address deprivation by providing better linkages to education, health and training destinations and providing wider access to jobs via improved journey times especially for people who do not have access to a car, such as young people. There will also be benefits for the elderly people and people with disabilities from increased mobility options presented by the re-opening of the branch line, providing enhanced opportunities for travel throughout the WoE.

10.7 Summary

10.7.1 The SoS must now determine whether the balance of interest between the conservation objectives of the Avon Gorge Woodlands SAC and the IROPI identified above weighs in favour of the IROPI. The detail of the IROPI, which includes over-riding public safety, human health, environmental benefits and (in respect of non-priority habitat only) socio-economic benefits is set out in section 10.3-10.6. It is the conclusion of this HRA Report that the predicted effects on the 0.07 ha of *Festuco-Brometalia* grassland (non-priority habitat) and 0.73 ha of *Tilio-Acerion* woodland are outweighed by the IROPI identified. Accordingly, it is concluded that consent for the DCO Scheme may be granted as the benefits outweigh the harm to the European site. In reaching this conclusion it is also appropriate to note that the DCO Scheme is unusual in the following respects:

- The impacts on habitat are not caused by the need to locate any part of the NSIP within the SAC. Rather, the impacts on habitat arise because of the need for specific measures to protect public safety by reducing the risk of accidents/ incidents on the line and secure wider human health, well-being and environmental benefits.

- There is 0.07 ha of *Festuco-Brometalia* grassland affected by the DCO Scheme. As this is non-priority habitat, socio-economic IROPI reasons have been applied for the Secretary of State to take into account with respect to this habitat. In respect of the 0.73 ha of *Tilio Acerion* woodland priority habitat affected by the DCO Scheme socio-economic effects cannot be taken into account in establishing whether there are IROPI.
- The reason for losses of some of the rare whitebeams is public safety, where trees are overhanging on rock faces and tunnel portals (Table 8.4). The approach taken to the assessment of impacts on the SAC in this HRA Report is highly conservative to ensure that there can be full confidence in the HRA. For example, an additional one tree per species has been predicted to be lost despite the likelihood being that micro siting of works in the Avon Gorge will reduce the potential for effects rather than increase them.
- The upgrading of the railway line to accommodate passenger trains is an evolution of the use of the railway corridor and indeed is a reversion to a service pattern that existed between 1867 and 1964. It is not a change in its nature; the works required are mostly temporary. Once the works have been undertaken the individual pockets of land affected will be left to rejuvenate just as the embankments were left following the construction of the original railway through the Avon Gorge.
- The vegetation management required for the scheme is cutting back rather than permanent removal. Once the works for the DCO Scheme have been carried out it is expected that much of the vegetation that has been cut back would re-establish rather than be permanently lost. Although vegetation will need to be cleared on the railway-side of the new fence, in all other areas there will be vegetation regrowth.
- As the proposed works will not involve extensive habitat loss there is considerable opportunity for protective measures to reduce the predicted impact on the integrity of the SAC.
- Further, it is considered that the DCO Scheme offers considerable opportunity to improve the wider management and conservation of the Avon Gorge Woodlands SAC through the facilitation of greater collaboration between NR and the FC through the AGVMP Ver. 02 proposed in respect of the DCO Scheme.

10.7.2 If, despite a negative assessment of the implications for the site and in the absence of alternative solutions, the SoS concludes that the DCO Scheme must nevertheless be carried out for imperative reasons of overriding public interest, including (for non-priority habitat) those of a social or economic nature, all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected shall be undertaken. The compensatory measures identified are presented in Section 11.

SECTION 11

Compensatory Measures

11.1 Introduction

11.1.1 The package of measures proposed to compensate for the loss of *Tilio-Acerion* woodland, *Festuco-Brometalia* grassland and whitebeam species in the Avon Gorge Woodlands SAC is described in this section.

11.1.2 As a general principle, a European site should not be irreversibly affected by a project before the compensation is in place. However, as the Commission Guidance (11/18) notes, there may be situations where it will not be possible to meet this condition. For example, the recreation of a woodland habitat would take many years to ensure the same functions as the original habitat negatively affected by a project. Therefore, best efforts should be made to ensure that compensation is in place beforehand and, in cases where this is not fully achievable, the competent authorities should consider extra compensation for the interim losses that would occur in the meantime. These have all been taken into account in the proposed compensatory measures described below.

11.1.3 The compensation must be additional to the contribution to the Natura 2000 network that the UK should have made under the Directives. NR is a statutory undertaker for the purposes of the Habitats Regulations Regulation 9, which means that it has a duty to have regard to the objectives of the Habitats Directive in the performance of its functions. NR is in the process of seeking approval from NE for a management plan to secure the conservation of that part of the Avon Gorge Woodlands SAC that lies within its ownership. Natural England has approved NR's SMS for the area. However, at the time of preparing the package of protective and compensatory measures for the DCO Scheme the NR's VMP for the first year (2019-20), NR Avon Gorge Planned of Works, has not been approved. Accordingly, the approach taken by the DCO Scheme promotor is, following discussions with NE, to propose a package of compensatory measures on sites that, cumulatively, total 3.2 ha from which NE can require the delivery of 1.6 ha of compensatory measures in accordance with the Habitats Regulations. It is intended to provide NE with the ability to approve whichever of the DCO Scheme areas of compensation it considers will best compensate for the predicted harm, taking into account the stage reached by NR in its own management plan. In this way the SoS will have certainty that the necessary compensatory measures will be secured, whilst also being satisfied that the conservation measures that NR is required to take in order to maintain or restore favourable conservation status within that part of the SAC that it owns will be delivered in accordance with the management plan that NE will oversee.

11.1.4 The Commission Guidance confirms that the nature of the compensatory measures appropriate or necessary to offset the adverse effects on a Natura 2000 site (i.e. in addition to what is already required under the Directives) may consist of habitat improvement in existing

sites, improving the remaining habitat on the site concerned or restoring the habitat on another Natura 2000 site, in proportion to the loss due to the plan or project.

11.1.5 In accordance with the Commission Guidance, compensatory measures should fulfil the following criteria:

- sufficiently targeted to the harm, such that the measures proposed are appropriate to the type of impact predicted;
- effective and feasible, with a reasonable guarantee of success;
- technically feasible, using best scientific knowledge and take account of the specific requirements of the ecological features to be reinstated;
- adequate in extent and directly related to the quantitative and qualitative aspects inherent to the elements of integrity;
- located in areas where they will be most effective in maintaining the overall coherence of the Natura 2000 network;
- acceptable in timing, with respect to the implementation of the plan or project and the implementation of the compensatory measure and take into account the time required for habitats to develop; and
- implemented in the long-term with a financial and legal basis to ensure this happens.

11.2 Overview of the Compensation Package

11.2.1 The package of compensation measures is presented within the AGVMP Ver. 02, which will be implemented at the start of the construction works. The measures primarily apply to land within NR ownership. However, there are additional options on FC land in relation to compensation for losses of individual whitebeams and for the loss of *Tilio-Acerion* woodland. With respect to compensation for loss of whitebeams, a site on FC land within the SAC boundary has been identified. With respect to compensation for loss of *Tilio-Acerion* woodland, an option has been included to carry out positive management on FC land that is outside but abuts the boundary of the Avon Gorge Woodlands SAC, because NE has suggested that this would help the DCO Scheme deliver greater benefit in terms of improving the integrity of the SAC. The FC land identified by NE abuts the Avon Gorge Woodlands SAC/Avon Gorge SSSI unit number 7, which comprises broadleaved woodland and through which the DCO Scheme passes. Providing a larger number of potential sites by including the potential for compensatory measures on an equivalent area of land on FC managed property as an alternative to providing some of the compensation sites only on NR land will allow an adaptive approach to compensation. This will enable NE to evaluate the compensation site options to be provided by the DCO Scheme in combination with the conservation measures to be provided by NR through its SMS and VMP (see Appendix 9.15, DCO Document 6.25), and to agree those that achieve the optimum outcome for the SAC in light of the circumstances prevailing at the time. As the FC land within which compensatory measures for woodland loss would be undertaken

abuts the SAC boundary it is envisaged that the land would be incorporated within the FC's Forest Design Plan that also includes the management plan for the land it owns within the Avon Gorge Woodlands SAC. In the short term this would de facto enlarge the area of land managed as part of the SAC. In the longer term the compensatory measures in conjunction with the planting of whitebeam should lead to the incorporation through subsequent designation of the improved FC land within the Avon Gorge Woodlands SAC.

11.2.2 Given that all land within the DCO Scheme boundary and NR ownership comprises qualifying features of the SAC (Figure 2 in Annex A), the focus of the compensation proposals within NR ownership is on the improvement of areas of existing qualifying habitats through positive management. This management would commence in some locations ahead of construction in tandem with clearance for geo-technical inspections whilst other areas would be addressed later in the five year programme.

11.2.3 The location of positive management areas falls within units 2, 6, 7 and 10 of the Avon Gorge SSSI which is the single component SSSI of the SAC. Of these units 2, 7 and 10, are in 'Unfavourable – recovering' condition; and Units 6 is in 'Favourable condition'. The main reason for the 'Unfavourable – recovering' condition is scrub encroachment of grassland and presence of non-natives, such as Cotoneaster, sycamore, Buddleja, holm oak and Rhododendron.

11.2.4 The potential for compensation on FC land is described in the AGVMP Ver. 02 Annex F, Figure 4 and AGVMP Ver. 02 Annex M woodland management plan (DCO Document Reference 8.12) as an alternative to some of the 23 sites identified on NR land. The compensation proposals will still be based on 1.6 ha of positive management in total (for woodland and grassland). This will allow an adaptive approach to compensation, enabling the DCO Scheme to deliver the optimum level of compensation for the SAC by improving an equivalent area of land on FC property as an alternative to compensation on NR land in some areas, if that is agreed to be preferable by NE. The total area of land identified within FC land comprises 4.15 ha, of which a proportion of the area will be managed to provide the necessary quantity of compensatory habitat. The proposed management is detailed in Annex M of the AGVMP Ver. 02 and includes selective felling of planted cherry, beech and conifer trees (Lawson cypress, hemlock, Corsican pine and Douglas fir) and re-coppice small-leaved lime in some areas.

11.2.5 The DCO Scheme has been the catalyst for discussions between NR and the FC for proposals to work together to implement the FC plan to undertake tree felling close to the freight line. The tree felling work requires a rail possession which NR may supply as part of their SMS. In addition, the DCO Scheme has provided rare whitebeam seed to FC for propagation.

11.3 Compensation for loss of *Tilio-Acerion* Woodland

11.3.1 The loss of 0.73 ha of *Tilio-Acerion* woodland is a worst-case estimate and is likely to be reduced during GRIP 5 detailed design. The preventative measures during construction will further avoid or reduce harm. However, the loss of this priority habitat cannot be fully mitigated and ancient semi-natural woodland (of which there is estimated to be a maximum of 0.40 ha loss) is an irreplaceable habitat which has developed over centuries.

11.3.2 The aim of the compensation measures is to improve the condition of existing *Tilio-Acerion* woodland. The areas selected for positive management measures are primarily areas of semi-natural ancient woodland that support species of whitebeam, but where the quality of the habitat has been negatively affected by shading and non-native species such as holm oak and cotoneaster. The locations of the areas are shown in Figure 1 of Annex F in the AGVMP Ver. 02 and the management prescriptions for each of the areas are set out in Annex G of the AGVMP Ver. 02.

11.3.3 The proposals for positive management in the AGVMP Ver. 02 focus on selective vegetation clearance to benefit rare whitebeam trees and woodland ground flora by reducing competition and shade from other plants, particularly invasive non-native species. As such, these proposals also contribute to the compensation for the loss of rare whitebeams, addressed in section 11.5. The measures include:

- Coppicing (of non-whitebeam species) and crown lifting in semi-natural ancient woodland.
- Clearance of ivy and bramble from secondary SAC woodland habitat to open up woodland habitat.
- Felling of non-native species including sycamore in SAC secondary woodland.
- Vegetation clearance around whitebeam trees, particularly invasive non-native species.

11.3.4 Priority has been given to management where rare whitebeams will be removed or coppiced for construction of the DCO Scheme at Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel, Valley Bridge, Bridge No. 6 and NR rock faces.

11.3.5 Each of the proposed areas will be surveyed in detail to develop appropriate management actions, as detailed in Section 4 of the AGVMP Ver. 02 (ES Appendix 9.11, DCO Document Reference 8.12).

11.3.6 The area identified within FC ownership that is proposed alternative option for restoration and positive management is identified in Annex F Figure 4 of the AGVMP Ver. 02 (ES Appendix 9.11, DCO Document Reference 8.12). The existing habitat is woodland with planted native and non-native trees and old coppice stools of small leaved lime (many with 1 stem left to grow).

11.3.7 This area is 4.15 ha in total but only a proportion of the area will be managed. A woodland management plan is included in Annex M of the AGVMP Ver. 02 (DCO Document Reference 8.12) and the management that is considered appropriate for this area of habitat is as follows:

- Selective felling of planted cherry, beech and conifer trees (Lawson cypress, hemlock, Corsican pine and Douglas fir)
- Re-coppice small-leaved lime in some areas within coppice panels 30 m x 30 m in size or coppicing a strip at the bottom of the slope. Trees subject to coppicing will be carefully selected and advised by an arboriculturalist. Some of the most lapsed coppice trees might not respond to coppicing, particularly if it is only a single stem on a significantly decayed coppice stool.
- Within coppice panels, deer fencing to be installed for 2 years or until coppice has taken with 2 m high fencing with steel mesh and chestnut stakes.

11.3.8 The total area required for positive management in woodland habitat (both ancient semi-natural and secondary recent) is estimated at 1.45 ha, which is more than double the area lost. This ratio has been agreed with NE as appropriate compensation for habitat losses in view of the measures making improvements to existing qualifying features, which will be evident as soon as the management is undertaken.

11.3.9 Where positive management has been undertaken on NR land (Appendix 9.11 AGVMP Ver. 02, Annex G, areas G1 to G26, DCO Document Reference 8.12), each site will be monitored subsequently in year 1, 3 and 5 after management This will entail survey of vegetation composition, including % scrub cover, identification and frequency of invasive species, locations of whitebeams and presence of any rare or notable grassland species. This will allow comparison with survey findings before and after management was undertaken to assess the effectiveness of the management measures. NSDC will be responsible for monitoring the sites in year 1, 3 and 5 after management.

11.3.10 Where positive management has been undertaken on FC land (AGVMP Ver. 02, Annex F, Figure 4, DCO Document Reference 8.12), as an alternative to NR land, monitoring will be as set out in Section 9 of the Annex M Woodland Management Plan (AGVMP Ver. 02, Annex M).

11.4 Compensation for loss of *Festuco-Brometalia* Grassland

11.4.1 The loss of 0.06 ha of grassland is primarily due to the location of a temporary site compound in the former quarry site on land owned by the National Trust (Quarry 2). This compound requires 0.04 ha of habitat and is needed for construction works to Quarry Bridge No. 2 and an associated ramp to allow access from the freight line to the site compound area (see ES Appendix 9.11 AGVMP Ver. 02, Annex C, DCO Document Reference 8.12). There are also areas of grassland that will be cleared along the new fence line (0.008 ha) and losses as a

result of geo-technical work on rock-faces, both NR-owned and third party-owned (0.008 ha). It is considered that the estimate of habitat loss is a worst case scenario, as micro-siting of rock bolts will be undertaken to minimise the impacts on rare species of plant, such as Bristol rock-cress (Schedule 8), that are characteristic species of the SAC grassland.

11.4.2 Measures to minimise impacts on the grassland and to restore the area affected by the temporary compound are described in Section 8.4. However, it is considered that the loss of *Festuco-Brometalia* grassland due to the compound, as well as work on rock-faces which could damage or destroy individual plants of Bristol rock-cress, are not fully mitigated and therefore require compensatory measures.

11.4.3 The aims of the compensation measures are to improve the condition of existing areas of *Festuco-Brometalia* grassland and to implement a strategy for Bristol rock-cress. The locations of the areas for positive management are shown in Figure 1 of Annex F in the AGVMP Ver. 02 (DCO Document Reference 8.12) and the management prescriptions for each of the areas are set out in Annex G of the AGVMP Ver. 02. The conservation strategy for Bristol rock-cress is provided in Annex K of the AGVMP Ver. 02 (Appendix 9.11 of the ES, DCO Document Reference 8.12).

11.4.4 The total area of positive management within the SAC grassland habitat is estimated at 0.15 ha, which is more than double the area lost (0.06 ha). This ratio has been agreed with NE as appropriate compensation for habitat losses in view of the measures making improvements to existing qualifying features, which will be evident as soon as the management is undertaken. The proposals for positive management of SAC grassland, as described in the AGVMP Ver. 02 (DCO Document Reference 8.12), focus on scrub control and the removal of non-native species including cotoneaster and holm oak.

11.4.5 Scrub species will be cut down to 50 mm above ground level, and arisings removed off site. The plants would be allowed to re-grow unless they are INNS which would have herbicide treatment using a non-residual herbicide applied in strict accordance with the manufacturer's recommendations to avoid transfer to non-target species.

11.4.6 Herbicide treatment would be specified in the Contract and agreed with NE and consent from the Environment Agency would be obtained if herbicide application is in proximity to a watercourse.

11.4.7 The strategy for Bristol rock-cress is presented in the AGVMP Ver. 02 (DCO Document Reference 8.12) and, as required, works would be the subject of a licence under the Wildlife and Countryside Act 1981 (as amended). The strategy includes: protection from damage by micro-siting as far as possible; translocation of individual plants to suitable alternative habitat; and propagation of new plants from collected seed for subsequent planting out in suitable habitat. Further detail is provided in Annex K of the AGVMP Ver. 02 (Appendix 9.11 of the ES, DCO Document Reference 8.12) and is summarised in paragraph 9.7.40 of ES Chapter 9 Ver. 02 (DCO Document Reference 6.12).

11.5 Compensation for loss of Whitebeam Species

11.5.1 Whitebeam species, some of which are endemic to the Avon Gorge, are key species in the *Tilio-Acerion* forest qualifying feature, as influential and distinctive species that are recognised as an attribute contributing to the structure and function of the habitat (Natural England, 2019). Rare species of whitebeam also occur within grassland habitat, scrub, on rock-faces and on bridge portals. Given the rarity and global importance of whitebeams within the Avon Gorge Woodlands SAC, compensation for loss is considered separately from the assessment of qualifying habitats. The positive management of existing woodland described in Section 11.3 will contribute to the compensation for loss of whitebeams, but more intensive intervention is proposed in order to ensure adequate compensation for the anticipated loss of individual whitebeams.

11.5.2 The loss of up to 27 rare whitebeam trees includes the loss of 12 Avon whitebeam (Table 8.5), which is estimated at 29% of world population of 42 trees endemic to the Avon Gorge (paragraph 8.5.7). Although it is anticipated that the loss of whitebeams can be reduced through further refinement of the construction activities, an intensive programme to improve long-term conservation of the rare species has been developed as part of the DCO Scheme. This programme has been developed with the advice of acknowledged global experts in Whitebeam ecology and conservation. Evidence of the success of previous whitebeam propagation projects, including one within Leigh Woods in the Avon Gorge, is provided in Annex H of the AGVMP Ver. 02 (Appendix 9.11 of the ES, DCO Document Reference 8.12). This project planted a range of species in the 1970s, which have generally grown well to maturity.

11.5.3 It is proposed to plant 54 whitebeam saplings to replace those removed as part of the DCO Scheme. The programme of whitebeam conservation is explained in Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12) and includes the following key elements:

- Collection of seed from Avon Whitebeam, Bristol Whitebeam, round-leaved whitebeam, Leigh Woods whitebeam, grey-leaved whitebeam and Wilmott's whitebeam from the Avon Gorge SAC between 2016 and 2019.
- The seeds collected from 2016 to 2018 are being grown onto sapling stage at Paignton Zoological Gardens (Annex I of the AGVMP Ver. 02, DCO Document Reference 8.12). At present, 72 rare Whitebeam species have been grown to sapling stage from the 2016 seed collection. Of these, five are Avon Whitebeam, 30 are Leigh Woods Whitebeam, 30 are Round-leaved Whitebeam and 7 are Bristol Whitebeam. An additional two Wilmott's Whitebeam and one grey-leaved Whitebeam have grown from the 2018 seed collection, making a total of 75 trees available (at the end of 2019) for planting. It is anticipated that there will be more trees available in

the future due to the germination of seeds collected in 2019 and from ongoing seed collection activity.

- To reduce the risk of failure of germination and to improve the overall chances of successful propagation, more seeds of rare species affected by the DCO Scheme and hardwood cuttings of Avon Whitebeam were collected in 2019 for propagation at Paignton Zoological Gardens and other suitable botanical gardens. Propagation could be undertaken as a rolling programme in future years if necessary and seed grown on since 2016 shows that successful propagation is possible.
- Identification and detailed characterisation of sites for planting of whitebeam saplings within NR ownership and one site within FC ownership in Avon Gorge Woodlands SAC.
- Development of a plan for maximising the success of whitebeam planting through site preparation and aftercare, including monitoring.
- Donation of any surplus whitebeam saplings to other landowners within the Avon Gorge Woodlands SAC e.g. FC.

Selection of Planting Sites

11.5.4 Seed collection and results of germination are detailed in Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12). A number of potential sites for planting of whitebeam saplings have been investigated in the field by whitebeam experts. The proposed sites have been selected using the following criteria:

- NR land or Forestry Commission ("FC") land[19].
- Sites where whitebeams will not affect safety on the railway in the future (e.g. on the embankments below the railway).
- Sites where competing vegetation can be managed safely in the short term until the trees are established.
- Sites where whitebeams can be monitored safely.
- Areas where there is no other significant nature conservation interest which may be affected.
- Sites where the whitebeams will get sufficient light and will not be shaded out by other trees (at least in short to medium term.
- Areas where non-native invasive species are present and may be removed, creating places where whitebeams can be planted.
- Sites where soil conditions are suitable. These soils are usually calcareous soils over limestone or limestone rubble on embankments for all species, or some sandstone-derived more acidic soils are suitable for Bristol whitebeam, common whitebeam *Sorbus aria* and round-leaved whitebeam.

[19] Following discussion with NE and FC in 2019 and 2020, the search area for suitable sites for whitebeam planting was extended to include FC land.

- Close to common whitebeam populations so pseudogamous pollination can be facilitated.
- Close to the existing whitebeams populations so they can contribute to metapopulation.

11.5.5 As a result of NE comments on the planting sites proposed in Annex H of the AGVMP Ver. 01 (DCO Document Reference 8.12), modifications to the proposals were made, including inclusion of a new site. Therefore, the planting proposals are presented as two alternative packages in a revised Annex H (AGVMP Ver. 02, DCO Document Reference 8.12), with the first package comprising the original planting sites detailed in Annex H of the DCO submission (AGVMP Rev. 01, DCO Document Reference 8.12), but with minor modifications to Site 3, and the second package adding a new planting site on FC land but removing the sites (Site 1a and Site 2) which had raised concerns with NE. Package 2 has been proposed in response to NE concerns over some aspects of Package 1 and hence is the preferred option. However, it cannot yet be presented as the only option as agreements with FC are not finalised. Also, in refining Package 1, the Applicant used detailed survey data to identify the trees that contribute to the qualifying *Tilio-Acerion* woodland and that will be retained. Therefore, with careful site preparation to facilitate the success of whitebeam establishment, the introduction of whitebeam to these areas would ultimately improve the quality of existing *Tilio-Acerion woodland*. The proposed planting packages are summarised in Table 11.1a below. None of the proposed planting sites are on the Ancient Woodland Inventory. The sites are described in Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12). The potential sites are:

- Site 1 (a and b) Nightingale Valley - east-facing embankments between the freight line and River Avon Tow Path (NR ownership).
- Site 2 Embankment between the operational freight line and the River Avon Tow Path north of Miles Dock Bridge (NR ownership).
- Site 3 Land above Clifton Bridge No. 2 Tunnel (southern end) (NR ownership)
- Site 4 Red oak plantation over sandstone (FC ownership).

Table 11a. Number of trees proposed at each site for each package

Package 1	**Losses**	**Site 1a**	**Site 1b**	**Site 2**	**Site 3**	**Site 4**	Total
Avon whitebeam *S. avonensis*	12	3			2		5
Bristol whitebeam *S. bristoliensis*	2	3	4				7
Round-leaved whitebeam *S. eminens*	5			26			26
Grey-leaved whitebeam *S. porrigentiformis*	1				1		1
Leigh Woods whitebeam *S. leighensis*	6	2	11				13
Wilmott's whitebeam *S. wilmottiana*	1				2		2
Total	**27**	**8**	**15**	**26**	**5**	**0**	**54**
Package 2	**Losses**	**Site 1a**	**Site 1b**	**Site 2**	**Site 3**	**Site 4**	Totals
Avon whitebeam S. *avonensis*	12		3		2		5
Bristol whitebeam *S. bristoliensis*	2					7	7
Round-leaved whitebeam *S. eminens*	5					27	27
Grey-leaved whitebeam *S. porrigentiformis*	1				1		1
Leigh Woods whitebeam *S. leighensis*	6		12				12
Wilmott's whitebeam *S. wilmottiana*	1				2		2
Total	**27**	**0**	**15**	**0**	**5**	**34**	**54**

11.5.6 Section 5.6 and 5.7 of the AGVMP Ver. 02 (DCO Document Reference 8.12) gives details of site preparation and whitebeam planting. Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12) makes recommendations that are specific to each of the planting sites (as summarised below). To ensure the greatest chance of success for the whitebeam saplings, the sites will need to be prepared to minimise encroachment and competition, whilst retaining as much of the existing interest as possible. This will include managing existing secondary mixed deciduous woodland and ground flora such as false brome *Brachypodium sylvaticum*, ash saplings, ivy and bramble. The red oak plantation will require clearance of red oak and other non-native species such as rhododendron *Rhododendron ponticum*. At all sites, non-native species will be removed and those trees which have been identified to be retained will be marked and protected prior to clearance.

11.5.7 To prevent the removed trees from competing with rare whitebeam planting, stump treatments with the appropriate herbicide will need to

be undertaken to ensure there is no excessive competitive regrowth of tree species that would then compete with the establishing whitebeam.

11.5.8 Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12) describes the current vegetation and substrates at the planting sites and the measures required to plant and establish whitebeam saplings at these sites. The report details the trees which are to be retained at each of the planting sites, in particular, individuals of small-leaved lime and whitebeams.

11.5.9 The Nightingale Valley site consists of two distinct areas (Sites 1a and 1b), both of which are of made ground on the east-facing embankment between the freight line and River Avon Tow Path. Site 1a is on the south-east side of the bridge and Site 1b is on the north-west side. Both sites support a current woodland type of W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity.

11.5.10 Site 1a covers 350 m^2 (35 m long and 10 m wide). The lower side is bounded by a wall c. 1.5 m tall and the upper side is fenced from the railway. Many trees show evidence of coppicing in the past, presumably from railway vegetation management. Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12) recommends that approximately 60% of this site will be required for planting and that most of the existing trees and shrubs will be removed with the exception of existing small-leaved lime, wych elm and Avon whitebeam. Holm oak, which occurs at 3% cover in the shrub layer, will be removed. Control of ivy will be required longer term. The site may also benefit from removal of young trees along the east side of the tow path (not NR land) to provide additional light.

11.5.11 Site 1b covers 550 m^2 north of the bridge (55 m long and 10 m wide). The lower side is bounded by a wall c. 1.5 m tall, the upper side adjacent to the railway is unfenced. Some trees show evidence of coppicing in the past (railway vegetation management) and some younger trees at the south end are maidens (single stem trees). At the north end beyond 55 m, the woodland is developed over rocky ground which may be original woodland floor; this area will not be affected. Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12) recommends that approximately 80% of this site will be required for planting and that most of the existing trees and shrubs will be removed with the exception of existing elm and field maple. Control of ivy will be required in the longer term. The site may also benefit from removal of young trees along the east side of the tow path (not NR land) to provide additional light.

11.5.12 The Miles Dock site is secondary (recent) woodland on made-ground on the embankment between the operational freight line and the River Avon Tow Path north of Miles Dock. The planting site covers 1,650 m^2 in total (110 m long and 15 m wide). The lower side is bounded by a wall c. 1.5 m tall, the upper side adjacent to the railway is unfenced. This is a railway embankment with made ground. The woodland type is W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity. Approximately 70% of this site will be required for planting and requires that most of the trees and

shrubs will be removed with the exception of the trees identified in Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12). Control of ivy will be required.

11.5.13 The Clifton Bridge No. 2 Tunnel site is on the line of the old informal 'goat' path adjacent to National Trust land, which is not clearly delineated from NR ownership. This is a small site of 30 m^2 in total (c. 10 m long and 3 m wide) and is open and unfenced. This is probably natural ground on the edge of the plateau, though modified by a path with a low 30 cm high mound of earth along its east side. The vegetation is open woodland edge and mixed scrub over a ground flora of false wood-brome *Brachypodium sylvaticum* and is NVC type is W21d *Crataegus monogyna – Hedera helix* scrub, *Viburnum lanata* subcommunity. The grassy layer under the young scrub is dominated by false wood-brome *Brachypodium sylvaticum* currently does not equate to the qualifying *Festuco-Brometalia* grassland of the SAC. However, the typical calcareous grassland species *Briza media* and *Carex flacca* are present in small amounts and therefore the planting proposals involve removal of encroaching scrub rather than to plant on grassland. The area of existing scrub on the west side of the relict path will be cleared to create an area for planting whitebeams. This scrub will be cut and the stumps treated with herbicide. Any non-native woody species in the immediate area outside the planting site such as Stern's cotoneaster *Cotoneaster sternianus* and holm oak will be removed and the stumps treated. Arisings will be placed within the adjacent scrub in a habitat pile (or piles) and left to decompose naturally. One plant of Pale St John's-wort *Hypericum montanum*, which is nationally IUCN category 'Near Threatened', is present at this site and will be avoided and protected with fencing prior to site preparation and whitebeam planting. The trees identified in Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12) will be retained.

11.5.14 Site 4 is an area of red oak plantation over sandstone. It is a slightly domed area bounded by the railway and Sandstone Tunnel on the south side and the River Avon Tow Path with a wall on the north side. This is probably a natural ground form on the east side of Paradise Bottom valley. The site is largely occupied by a red oak plantation which has been planted on the slopes with easy access. The northern edge appears to be older woodland with pedunculate oak *Quercus robur* and small-leaved lime *Tilia cordata*. The plantation type does not equate to an NVC community. The red oak plantation is within the SAC but does not support qualifying habitats. This area had been identified, independently of the DCO Scheme, by the FC and NE as having the potential for replacement of the red oak plantation with native trees and shrubs such as hazel and small-leaved lime as part of wider improvements to the SAC woodlands. To provide appropriate compensation for the loss of whitebeam as a result of the DCO Scheme, approximately 10% of Site 4 will be required for planting. The rare whitebeams that are currently located within Site 4 will be retained; six round-leaved whitebeams currently occur in the plantation and eleven round-leaved whitebeams occur on the tow path wall, so details of these have also been included as these are at risk when felling is under way. All of the existing whitebeams on Site 4 are shaded

saplings that will not flower and fruit but could be allowed to grow by appropriate management of the surrounding woodland. The existing whitebeams will be marked and protected during any management works. Site 4 may also benefit from removal of adjacent trees along the railway cuttings on NR land to provide additional light.

Whitebeam Planting

11.5.15 The appointed landscape contractor will carry out tree planting and maintenance as specified in the contract to comply with NR planting requirements (NR planning, planting and maintenance schedule) and specific requirements of rare whitebeam trees.

11.5.16 All planting works shall be carried out in accordance with BS 8545:2014; *Trees: from nursery to independence in the landscape – Recommendations*, BS 4043 *Recommendations for planting root balled trees,* BS 4428 *Code of practice for general landscape operations (excluding hard surfaces)* and BS 5837 *Trees in relation to design, demolition and construction* at the locations specified in Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12).

11.5.17 On completion of planting operations, all disturbed accesses to, and ground around the planted areas shall be completely reinstated to their former condition as at the commencement of planting. Compliance with this requirement will be measured by records and photographs taken before and after planting.

11.5.18 All whitebeams supplied shall be sourced from Paignton Zoological Gardens (or other botanical gardens used for propagation) from the seeds collected from the Avon Gorge in 2016 and 2018 and will consist of tree saplings grown on from that seed. Whitebeams may be sourced from other saplings grown on from seed or cuttings which have been collected from the Avon Gorge in subsequent years, if successful.

11.5.19 Plants will be planted in an area where their canopy/branches will not grow within 3 m of the operational rail corridor.

11.5.20 Appropriate measures such as fencing and tree guards shall be used to protect planted trees from pest species, such as rabbits and deer and this will be specified in the contract.

Maintenance of planting sites

11.5.21 The sites chosen offer a good probability of success, however, it is important that the ongoing ten-year maintenance programme after initial (year 1) planting (Annex H of the AGVMP Ver. 02, Appendix 9.11 of the ES, DCO Document Reference 8.12) is followed to ensure good establishment for these sensitive species. Details of aftercare are provided in Annex H of the AGVMP Ver. 02 (Appendix 9.11 of the ES, DCO Document Reference 8.12).

11.5.22 A specialist contractor will be employed to plant, manage and maintain the whitebeam trees. A contract will be written to specify e.g. plant protectors, handling plants, frost protection, timing of planting, planting depth, type of stakes and watering. It will also cover the maintenance of the plants for ten years after initial planting (year 1), including inspection intervals, plant circles and depth of mulch.

11.5.23 Any whitebeams that die or are damaged by rabbits or deer due to the failure to maintain the fences, shelters or guards, desiccation or disease shall be replaced from the stock available at Paignton Zoological Gardens or from other locations where whitebeams have been propagated for this project.

11.5.24 The replacement whitebeams shall be maintained in accordance with the stipulated maintenance measures.

Monitoring of planting sites

11.5.25 Monitoring of the planting sites for rare whitebeam saplings is detailed in Annex H of the AGVMP Ver. 02 (DCO Document Reference 8.12) and summarised in Table 11.1.

Table 11.1: Summary of the planting and monitoring programme for rare whitebeam saplings

Date	Task
Year 1, end of construction phase	The initial planting will be undertaken in early March. A report with planting plan and tree numbers will be produced. Between April and September they will be checked monthly to undertake watering if necessary and other care requirements such as removal of weed growth, check tree guard positioning and tree survival, as stipulated in the contract.
Year 2	Saplings will be checked in March and September to undertake care requirements such as removal of ivy. If they are suffering from establishment issues such as desiccation this will be taken into account and frequency of management/monitoring increased to monthly if required between April and September inclusive. In March, any replacement planting will be carried out using stock reserved at Paignton Zoological Gardens (or other botanical gardens used to propagate the seed collected) and management/monitoring of new plants will be as detailed in Year 1.
Year 3 - 10	In years 3 to 10 after initial planting, the saplings will be checked in March and September to undertake care requirements. In March, any replacement planting will be carried out using stock reserved at Paignton Zoological Gardens (or other botanical gardens used to propagate the seed collected) and management/monitoring of new plants will be as detailed in Year 1.

11.6 Summary

11.6.1 The conservative (worst case) approach taken to calculating the potential area of losses of *Tilio-Acerion* woodland and *Festuco-Brometalia* grassland is compared to the compensatory measures proposed in the form of positive management for SAC grassland and

woodland in Table 11.2. In summary, a total 0.79 ha of SAC habitat is assumed to be lost as a worst-case estimate, and 1.6 ha of habitat that is not currently in favourable conservation status would be subject to positive management. Of this, approximately 0.15 ha of positive management will be within grassland habitats, which is found only within NR ownership. An adaptive approach, agreed with NE, is being taken to compensating for the loss of woodland habitat, with an area of approximately 1.45 ha of positive management either in SAC woodland within NR ownership or with an option to substitute some or all of this with woodland management in FC land, which is not within the SAC, depending on what is agreed by NE and NSC to deliver most benefit to the SAC at the time of implementation.

Table 11.2: Areas of vegetation clearance within SAC woodland (semi-natural ancient woodland and secondary woodland) and SAC grassland compared to areas where positive management is proposed

Areas	SAC Habitats				
	Semi-natural ancient woodland	Secondary woodland	Woodland total	Grassland	Total
Total area lost (m^2)	4,002	3,280	7,282	582	7,864
Total area lost (ha)	0.40	0.33	0.73	0.06	0.79
Positive management proposed (m^2)	12,582	1,914	14,496	1,470	15,966
Positive management proposed (ha)	1.26	0.19	1.45	0.15	1.60

11.6.2 The compensation package also includes a whitebeam planting strategy and a conservation strategy for Bristol rock-cress, as detailed in the AGVMP Ver. 02 (Appendix 9.11 of the ES, DCO Document Reference 8.12).

11.6.3 The proposed positive management is in accordance with the Site Improvement Plan and NE's Supplementary Guidance (2019) for the SAC. Invasive plant species have been identified as a threat to SAC qualifying habitats (woodland and grassland) and management of these are required (as part of an Avon Gorge wide plan). Changes in species distributions (woodland and grassland habitats) are also identified in the Site Improvement Plan as a threat, largely via scrub and invasive species.

11.6.4 In the absence of the DCO Scheme, the threats to SAC qualifying habitats within the NR landholding are predominantly as a result of continued encroachment by non-native invasive species in woodland

and grassland and also natural succession to scrub in grassland habitats. Under Article 6(1) of the Habitats Directive the UK is required to draw up conservation measures and adopt appropriate statutory, administrative or contractual measures with the aim of maintaining or restoring, favourable conservation status, natural habitats and species of wild fauna and flora of Community interest. These measures should take into account economic, social and cultural requirements and regional and local characteristics. The European Commission Guidance explains that its purpose and nature is to provide guidelines to Member State authorities as well as anyone involved in the management of Natural 2000 sites and in the Article 6 permit procedure, in the application of the Habitat Directive. It records that only the CJEU is competent to authoritatively interpret Union law and states that the interpretations provided by the Commission cannot go beyond the Directive "*this is particularly true for this directive as it enshrines the subsidiarity principle and as such lets a large margin of manoeuvre to Member States for the practical implementation of specific measures related to the various sites of the Natura 2000 network. In any case, the Member States are free to choose the appropriate way they wish to implement the practical measures, provided the latter achieves the results of the Directive*".

11.6.5 The Commission Guidance of November 2018 lists the key elements to consider in establishing the necessary conservation measures as: a sound knowledge base; participation, consultation and communication; defining necessary conservation measures with sufficient level of detail; the necessary resources for implementation; and effective implementation and communication.

11.6.6 Accordingly, the compensatory measures proposed in respect of the DCO Scheme to take place within land owned by NR within the SAC are those that will be demonstrably over and above the 'normal' conservation measures that can realistically be expected to be undertaken by NR within the relatively short time-frame of the programme. In the absence of the DCO Scheme, the likely result is further deterioration of the condition of these habitats. Thus, whilst the DCO Scheme would result in the loss of small areas of the SAC qualifying habitats and associated rare whitebeam species, the proposed compensatory positive management would improve the condition of retained habitats and contribute to improving the condition of the SAC and SSSI.

11.6.7 It is considered that the measures in place would be sufficient to ensure that, once the habitat had been restored and ongoing proactive management is in place as part of the AGVMP Ver. 02 (DCO Document Reference 8.12), there would be no further net loss of priority habitat and that the quality and condition of retained qualifying habitat would increase. The impacts of the DCO Scheme on both woodland and grassland habitat is very limited and positive management of approximately double the area lost would improve the condition of the SAC qualifying features. It is also considered that the adaptive approach of undertaking compensation on FC woodland outside of the SAC, or a combination of both, would compensate for

habitat loss, depending on what is agreed by NE and NSC, to deliver most benefit to the SAC at the time of implementation.

11.6.8 Table 11.3 summarises how the proposed compensation measures comply with the criteria in Commission Guidance (11/18).

Table 11.3 Summary of Compensation Measures and Compliance with EC Guidance (11/18)

Criteria	Qualifying Feature					
	***Tilio-Acerion* woodland**				***Festuco- Brometalia* Grassland**	
Impact	Permanent loss of 0.73 ha			Loss of 27 whitebeams	Permanent or long-term temporary loss of 0.06 ha	Vegetation removal of 20 m^2 on a rock-face where Bristol rock-cress is present
Compensation measure	Positive management in 1.45 ha of existing degraded Priority Habitat SAC woodland	OR Positive management and restoration of 1.45 ha within FC land, not currently designated as SAC.	OR a mixture of both, with a total area of 1.45 ha	Propagation and planting out in selected planting sites – proposed to plant 54 saplings.	Positive management of 0.15 ha of degraded SAC grassland	Bristol rock-cress conservation strategy
Criterion 1: Targeted to the harm	Yes - improves the quality of existing Priority Habitat which has become overgrown with invasive non-native species. This will be delivered in addition to the conservation measures undertaken by NR, enabling NE to secure the most effective balance of conservation and compensation works in the best interests of the SAC.	Yes- restores *Tilio-Acerion* type woodland outside the SAC boundary, with the aim of increasing the extent of the Annex 1 habitat adjacent to the existing designation.	Yes - adaptive approach enables delivery of the optimum level of compensation, which is most appropriate at the time of implementation of the DCO Scheme, enabling NE to secure the most effective balance of conservation and compensation works in the best interests of the SAC.	Yes- planting of propagated whitebeams from collected seed is directly targeted to the loss of the same species.	Yes – restores and improves the quality of existing SAC habitat which has become overgrown with scrub and invasive non-native species.	Yes- translocation and planting of propagated plants from collected seed is directly targeted to the loss of individual plants of this species.

Table 11.3 Summary of Compensation Measures and Compliance with EC Guidance (11/18)

Criteria	Qualifying Feature					
	***Tilio-Acerion* woodland**				***Festuco- Brometalia* Grassland**	
Criterion 2: Effective	Yes - removal of such invasive species is undertaken routinely throughout the UK and methodologies are well-established.	Yes – removal of non-native species over and above necessary conservation measures and coppicing small-leaved lime will accelerate development of the habitat.	Yes – removal of non-native species over and above necessary conservation measures and coppicing small-leaved lime will accelerate development of the habitat.	Yes – evidence of successful whitebeam planting projects in Leigh Woods (Avon Gorge), Penmoelallt, Powys, North Devon and Arran (Annex H of the AGVMP Ver. 02, DCO Document Reference 8.12)	Yes - removal of such invasive species is undertaken routinely throughout the UK and methodologies are well-established.	Yes – examples of establishing and growing this species from seed are given in Annex K in Appendix 9.11 AGVMP Ver. 02 of the ES (DCO Document Reference 8.12).
Criterion 3: technically feasible	Yes – the areas of positive management have been selected for their suitability for re-establishment of whitebeam and other *Tilio-Acerion* woodland species.	Yes – the areas have been selected for their suitability for re-establishment of whitebeam and other *Tilio-Acerion* woodland species.	Yes – the areas have been selected for their suitability for re-establishment of whitebeam and other *Tilio-Acerion* woodland species.	Yes –whitebeam planting sites are suitable in terms of current vegetation and substrate (Annex H of AGVMP Ver. 02, DCO Document Reference 8.12)	Yes – removal of scrub and INNS from grassland will enable restoration of grassland vegetation.	Yes – feasibility of transplanting and propagation is explored in Annex K in Appendix 9.11 AGVMP Ver. 02 of the ES (DCO Document Reference 8.12) and will be further developed before implementation.
Criterion 4: Adequate in extent	Yes – exceeds the 2:1 ratio agreed with NE	Yes – exceeds the 2:1 ratio agreed with NE	Yes – exceeds the 2:1 ratio agreed with NE	Yes – the number of saplings to be planted is double the number to be removed.	Yes – exceeds the 2:1 ratio agreed with NE	Yes – the aim of the conservation strategy is to replace double the number of any plants lost.

Table 11.3 Summary of Compensation Measures and Compliance with EC Guidance (11/18)

Criteria	Qualifying Feature					
	***Tilio-Acerion* woodland**				***Festuco- Brometalia* Grassland**	
Criterion 5: Located where they will be most effective	Yes – within the SAC in areas of ancient semi-natural woodland and recent woodland close to the areas being lost	Yes – within the SAC or adjacent to the SAC in areas of woodland with potential to achieve SAC quality	Yes- adjacent to the SAC in areas of woodland with potential to achieve SAC quality	Yes – in areas of recent woodland within the SAC	Yes – in degraded SAC grassland habitat within the SAC	Yes – original plants and/or seed will be replanted/sown in appropriate micro-habitats on rock faces ID06 and in Quarry 1 on the rock face adjacent to the railway (both NR land within the SAC).
Criterion 6: Acceptable in timing	Yes - implemented during the construction phase (about 20 months duration)	Yes - implemented during the construction phase (about 20 months duration) and areas / methods to be agreed in advance with NE.	Yes - implemented during the construction phase (about 20 months duration) and areas / methods to be agreed in advance with NE.	Yes – seed collection and propagation underway since 2016 and saplings to be planted out after construction	Yes - implemented during the construction phase (about 20 months duration) and areas / methods to be agreed in advance with NE	Yes – seed will be collected prior to construction in June or July. Any affected plants will be collected, with existing soils, in autumn or spring, before site clearance. Seeds will be propagated and grown on and then planted out at an appropriate time of year.
Criterion 7: implemented in the long-term	Yes - areas where positive management has been completed on NR land will be	Yes - areas where positive management has been completed on NR land will be	Yes - areas where positive management has been completed on NR land will be	Yes - planted rare whitebeam trees will be managed and monitored annually for	Yes - areas where positive management has been completed will be monitored in	Yes- monitoring will be carried out twice a year for two years after initial planting in

Table 11.3 Summary of Compensation Measures and Compliance with EC Guidance (11/18)

Criteria	Qualifying Feature					
	***Tilio-Acerion* woodland**				***Festuco- Brometalia* Grassland**	
	monitored in year 1, 3 and 5 following the construction phase or as detailed in the Woodland Management Plan for FC land.	monitored in year 1, 3 and 5 following the construction phase or as detailed in the Woodland Management Plan for FC land.	monitored in year 1, 3 and 5 following the construction phase or as detailed in the Woodland Management Plan for FC land.	ten years after the initial planting (year 1)	year 1, 3 and 5 following the construction phase or completion of management.	year 1, then annually for another 3 years then every two years up to nine years after initial planting.

11.6.9 In conclusion, the loss of qualifying *Tilio-Acerion* woodland and *Festuco-Brometalia* grassland affects the achievement of the habitat extent and distribution conservation objective for the SAC. However, the compensation package will contribute positively towards the conservation objectives for habitat extent and distribution and habitat structure and function. Therefore, it is concluded that the preventative measures described in Section 8, in conjunction with the compensatory measures, will be effective in providing for the long term favourable conservation status of the Avon Gorge Woodlands SAC.

11.7 Coherence of the Natura 2000 Network

11.7.1 The compensatory measures as described above must ensure that the overall coherence of Natura 2000 is protected. To demonstrate this, the role of the site within the national and biogeographical regions and its contribution to the coherence of the Natura 2000 network must be understood. This is related to the conservation objectives of the qualifying features, the quantity and quality of the qualifying features and the role of the site in ensuring adequate geographic distribution in relation to the range of the habitats concerned (EC Guidance (11/18).

11.7.2 Avon Gorge Woodlands SAC is described in Sections 6.2 and 8.2 above and the contribution of the qualifying features within this site to coherence of the network is expanded further below, using information from NE's Standard Data Form for the site[20] and from Annex 1 habitat descriptions[21].

Tilio-Acerion forests of slopes, screes and ravines

11.7.3 The distribution of *Tilio-Acerion* is centred in continental Europe, but is widespread from Scandinavia through to the Pyrenees and into Italy. *Tilio-Acerion* forests are not extensive in the UK, although fragmentary stands are widespread. The woodland habitat supported by the Avon Gorge Woodlands SAC is considered representative of *Tilio-Acerion* forests in south-west England and is one of the best areas in the UK for this Annex 1 habitat. The high frequency of small-leaved lime and the presence of rare whitebeam species make this site particularly important. Although the Avon Gorge Woodlands SAC contributes less than 2% of this habitat type within the UK, the global assessment of the value of the Avon Gorge site for conservation of this habitat is 'Good'.

11.7.4 The Avon Gorge Woodlands SAC supports 105.75 ha of *Tilio-Acerion* woodland, of which it is estimated that 0.73 ha (0.69%) will be lost as a result of the DCO Scheme, with an area of 1.45 ha of compensation through positive management and restoration. The area lost is estimated to comprise 0.40 ha of ancient semi-natural woodland and 0.33 ha of recent (secondary) woodland. This habitat loss is within NR land ownership, which is on the boundary of the SAC designation on the North Somerset side of the Avon Gorge (Figure 2 in Annex A of this HRA). The SAC designation encompasses both the railway line itself and the River Avon Tow Path and extends to the mean high water

[20] https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0012734.pdf

[21] https://sac.jncc.gov.uk/habitat/H9180/ and

spring ("MHWS") line of the River Avon. As such, the habitat loss is on the periphery of the designated area, is largely linear in nature and is very small relative to the total extent in the SAC and in the wider Natura 2000 network. The compensatory measures are to be undertaken within or adjacent to the SAC and cover an area more than double that lost. Therefore, the coherence of the habitat within the Natura 2000 network will be maintained.

Semi-natural dry grasslands and scrubland facies on calcareous substrates: *(Festuco-Brometalia)*

11.7.5 Semi-natural dry grasslands, which were once widespread in Europe, are now a scarce and threatened habitat. There are no overall estimates available for the extent of this habitat type in Europe as a whole. *Festuco-Brometalia* grasslands occur widely on suitable substrates in England and Wales, but are much more restricted in Scotland and Northern Ireland. The Avon Gorge Woodlands SAC is considered to support a significant presence of this habitat (6.93 ha) and a number of rare plants are associated with this habitat. However, the habitat is not a primary reason for the selection of the site.

11.7.6 The loss of an estimated 0.06 ha (0.84%) of qualifying grassland as part of the DCO Scheme is mainly due to the location of a construction compound in a disused quarry and vegetation clearance along the new fenceline. Some of this habitat loss is considered to be temporary and to extend for as long as the construction phase (20 months) and the time taken to restore the grassland following removal of the site compound and for grassland species to regenerate naturally (in places) along the fence line. Given the small quantity of habitat loss relative to the total extent in the SAC and in the wider Natura 2000 network; the temporary nature of some of the loss; and the proposals to remove scrub and invasive species from an area more than double that lost, the coherence of the habitat within the Natura 2000 network will be maintained.

11.8 Conclusions

11.8.1 The decision to go ahead with a plan or project must meet the conditions and requirements of Article 6(4). In particular, it must be documented that:

- the alternative put forward for approval is the least damaging for habitats, for species and for the integrity of the Natura 2000 site(s), regardless of economic considerations, and that no other feasible alternative exists that would not adversely affect the integrity of the site(s);
- there are imperative reasons of overriding public interest, including 'those of a social or economic nature';
- all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected are taken.

11.8.2 For the reasons set out above it is considered that all three tests are met in the case of the DCO Scheme and that the adverse impact on the integrity of the Avon Gorge Woodlands SAC predicted at Stage 2 is

adequately compensated. It is concluded that the grant of consent for the DCO Scheme will not cause detriment to the maintenance of the overall coherence of the Natura 2000 network. The grant of consent to the DCO Scheme offers potential to improve the condition of the Avon Gorge Woodlands SAC.

SECTION 12

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SECTION 13

Abbreviations

AGVMP	Avon Gorge Vegetation Management Plan
APIS	Air Pollution Information System
AQS	Air Quality Strategy
AWT	Avon Wildlife Trust
B&NES	Bath and North East Somerset
BCC	Bristol City Council
BRERC	Bristol Regional Environmental Records Centre
CEMP	Construction Environmental Management Plan
ch	chain
CJEU	Court of Justice of the European Union
CoCP	Code of Construction Practice
DAS	Discretionary Advice Service
DCO	Development Consent Order
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DLL	District Level Licensing
EcCoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EOMS	European Offshore Marine Sites
ES	Environmental Statement
EU	European Union
FC	Forestry Commission
GRIP	Governance for Railway Investment Projects
GSM-R	Global System for Mobile Communications – Railway
GVA	Gross Value Added
HIA	Health Impact Assessment
HRA	Habitats Regulations Assessment
INNS	Invasive and Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
IUCN	International Union for Conservation of Nature
JLTP	Joint Local Transport Plan
JNCC	Joint Nature Conservation Council
JSP	Joint Spatial Plan

JTS	Joint Transport Study
LSE	Likely Significant Effect
MHWS	Mean High Water Spring
mi	mile
MOVA	Microprocessor Optimised Vehicle Actuation
NCN	National Cycle Network
NPPF	National Planning Policy Framework
NPSNN	National Policy Statement for National Networks
NSDC	North Somerset District Council
NSIP	Nationally significant infrastructure project
NVC	National Vegetation Classification
OSGR	Ordnance Survey grid reference
PIT	Passive Integrated Transponder
PPG	Pollution Prevention Guidance
SAC	Special Area of Conservation
SGC	South Gloucestershire Council
SMS	Site Management Statement
SNCB	Statutory Nature Conservation Bodies
SNCI	Site of Nature Conservation Interest
SoS	Secretary of State
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
VMP	Vegetation Management Plan
WeBS	Wetlands Bird Survey
WECA	West of England Combined Authority
WoE	West of England

SECTION 14

Glossary

Term	Meaning
Air Quality Strategy ("AQS")	The Air Quality Strategy contains standards, objectives and measures for improving ambient air quality.
the Applicant	The party that submits a planning application. For the Portishead Branch Line (MetroWest Phase 1) DCO Scheme, the applicant is North Somerset District Council, on behalf of the four West of England Councils.
Ashton Junction	Ashton Junction is the existing junction located in south Bristol on the Portbury Freight Line forming the eastern end of the existing single track line through to Portbury Dock, located approximately 1 km west of Parson Street Junction.
Assessment	A process by which information about effects of a proposed plan, project or intervention is collected, assessed and used to inform decision-making.
Ballast	Track ballast forms the trackbed upon which railway sleepers are laid. It is used to bear the load from the railroad sleepers, to facilitate drainage of water, and also to keep down vegetation that might interfere with the track structure. This also serves to hold the track in place as the trains roll by. It is typically made of crushed stone.
Best Practice	A method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark.
Biodiversity	The variety of life forms, the different plants animals and micro-organisms, the genes they contain and the ecosystems they form. Considered at three levels: genetic, species and ecosystem diversity.
Bridleway	A right of way that the general public can use on foot and on horse.
Bristol to Exeter main line	The main railway line between Bristol Temple Meads and Exeter via Taunton.
Construction Environmental Management Plan ("CEMP")	A plan developed prior to any construction works commencing on site, the primary purpose of which is to guide environmental management of implementation of a project.

Term	Meaning
Consultation	A process by which regulatory authorities, statutory and non-statutory bodies, and the general public are approached for information and opinions regarding a development proposal.
Culvert	A covered channel or pipe designed to prevent the obstruction of a watercourse or drainage path by an artificial construction.
Designations	Notable sites, areas, buildings or structures protected by planning or other laws. Designations can be applied at the international, national, regional and local level.
Development Consent Order (DCO)	This is the means of obtaining permission for developments, such as energy, transport, water and waste schemes that are categorised as Nationally Significant Infrastructure Projects under the Planning Act 2008.
Disused Railway	The former railway line between Portishead and Portbury Dock Junction
Effect	Term used to express the consequence of an impact (expressed as the 'significance of effect'). For example, land clearing during construction results in habitat loss (impact), the effect of which is the significance of the habitat loss on the ecological resource. In EIA studies, it is determined by combining the magnitude of the impact and the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Enhancement	A measure that is over and above what is required to mitigate the adverse effects of a project.
Environmental Assessment	A method and a process by which information about environmental effects is collected, assessed and used to inform decision-making. Assessment processes include Strategic Environmental Assessment, Assessment of Implications on European Sites and Environmental Impact Assessment.
Environmental Impact Assessment ("EIA")	A process by which the impact of certain planned projects on the environment is assessed before a formal decision on an application for planning-related consents can be made.
Environmental Scoping Report	A report documenting the process of identifying the content and extent of the environmental information to be submitted to the competent authority under the EIA procedure.

Term	Meaning
Environmental Statement (“ES”)	A document produced to support a planning application for development that is subject to Environmental Impact Assessment, which sets out the likely impacts on the environment arising from the proposed development.
Existing Freight Line	The part of the Portishead Branch Line between Portbury Dock Junction and Parson Street Junction, being part of the national rail network managed by NRIL
Greenhouse Effect	Natural process by which the atmosphere traps some of the sun's energy, warming the earth.
Greenhouse Gas Emissions	Emissions of gases which trap heat in the atmosphere. The primary greenhouse gases in the Earth's atmosphere are water vapour, carbon dioxide, methane, nitrous oxide, and ozone.
Governance for Railway Investment Projects (“GRIP”)	GRIP is the Network Rail process to manage and control investment projects which enhance or renew the national rail network.
Health Impact Assessment (“HIA”)	A combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population and the distribution of those effects within the population.
Impact	Change that is caused by an action; for example, land clearing (action) during construction which results in habitat loss (impact).
Infrastructure	Refers to the fundamental facilities and systems serving a country, city, or area, including the services and facilities necessary for its economy to function. It typically characterises technical structures such as roads, railways, bridges, tunnels, water supply, sewers, electrical grids and telecommunications etc.
Landscape	Human perception of the land contained by knowledge, cultural associations and identity with a place. Guidelines for Landscape and Visual Impact Assessment: Third Edition defines landscape as “an area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors”.
Local Transport Plan	A strategic document published by local authorities or a group of local authorities to maintain and improve transport in their respective areas.

Term	Meaning
the MetroWest Phase 1 project or the Project	The MetroWest Phase 1 project comprises the delivery of infrastructure and passenger train operations to provide: • a half hourly service for the Severn Beach line (hourly for St. Andrews Road station and Severn Beach station); • a half hourly service for Keynsham and Oldfield Park stations on the Bath Spa to Bristol line; and • an hourly service (or an hourly service plus) for a reopened Portishead Branch Line with stations at Portishead and Pill. The Project is being led by North Somerset District Council on behalf of the West of England Authorities comprising West of England Combined Authorities ("WECA"), Bristol City Council ("BCC"), Bath and North East Somerset Council ("B&NES"), and South Gloucestershire Council ("SGC"), as a third party promoted rail project.
Mitigation	Measures intended to avoid, reduce, remedy and compensate for significant adverse environmental effects.
Nationally Significant Infrastructure Project ("NSIP")	A nationally significant infrastructure project ("NSIP") is a major scheme defined by the Planning Act 2008 as amended. NSIPs include the construction of a new railway when it is wholly within England, will form part of a network operated by an approved operator and is over a threshold of 2 km in length.
National Planning Policy Framework ("NPPF")	The NPPF set out the Government's planning policies for England. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.
NCN26 and NCN41	National Cycle Networks routes 26 and 41, designated by Sustrans.
Non-Statutory Designations	Sites and areas designated under the local planning system but which do not have statutory protection.
NSIP works	The NSIP works comprises a 5.45 km section of railway from a new station at Portishead to Portbury Junction, connection onto the existing Portbury Freight Line with a new junction (Pill Junction), near Pill Viaduct.
Ordnance Survey ("OS")	Mapping agency of the British Isles.

Term	Meaning
Parson Street Junction	Parson Street Junction is an existing junction located in south Bristol connecting the Portbury Freight Line with the Bristol to Exeter main line.
PD Works or General Permitted Development works	Works for which planning consent is already provided by statutory instrument rather than requiring express planning permission, through Permitted Development Rights. The General Permitted Development ("PD") works for MetroWest include: • Modification of Parson Street Junction including works at Liberty Lane freight depot; • Improvements to Parson Street Station; • Bedminster Down Relief Line (partial re-instatement of a disused track on the Bristol to Exeter railway north east of Parson Street junction); • Removal of interlock between existing signals at Holesmouth Junction on the Severn Beach line to allow for the increase in trains movements; and • Bathampton Turnback.
Permitted Development Rights	The Town and Country Planning (General Permitted Development) (England) Order 2015 consolidates, for England, the Town and Country Planning (General Permitted Development) Order 1995 and the 22 instruments that have amended the 1995 Order. Under this Order, the SoS grants planning permission for different types of development in specified circumstances. These permissions are usually subject to certain limitations and conditions, including in some cases a condition that a developer applies to a local planning authority for a determination as to whether their prior approval is required for certain impacts before the development can begin.
Phase 1 Habitat Survey	Recognised standard methodology for collating information on the habitat structure of a particular site.
Pill Junction	Pill Junction is a proposed junction between Pill Viaduct and Pill Tunnel where the track from Portishead will connect onto the existing Portbury Freight Line, with a section of parallel tracks running through Pill. Pill Junction will form the western end of the single track section of line, through the Avon Gorge to Ashton Junction.

Term	Meaning
Pollution	An increase of matter or energy to a level considered harmful to living organisms or their environment.
Portbury Junction	Portbury Junction is located west of Pill where the Portbury Freight Spur diverges from the route of the Disused Railway to Portishead. The junction is not in operational use and the Portbury Freight Line is formed of plain track at this location.
Portbury Freight Spur or PYR	The Freight Spur is a section of 500 metres of railway from Portbury Dock Junction to Royal Portbury Dock, owned by Bristol Port Company. The Spur forms part of the Portbury Freight Line.
Portbury Freight Line	The Portbury Freight Line is the existing operational freight line from Royal Portbury Dock to Parson Street Junction.
Portbury Wharf Nature Reserve	Portbury Wharf Nature Reserve is a 116 acre nature reserve created and maintained by North Somerset Council to provide a green buffer between the port and the Ashlands housing development on the eastern fringe of Portishead.
Planning Inspectorate	The Planning Inspectorate is an executive agency of the Department for Communities and Local Government responsible for deciding on final outcomes of planning appeals, public examination of local development plans and planning applications for nationally significant infrastructure projects.
Planning Policies: NPS NPPF NPPG SPD NDP	The MetroWest programme (and elements of) has been included in local planning frameworks and alongside national policies including National Policy Statements, National Planning Policy Framework, National Planning Practice Guidance, Supplementary Planning Documents, Neighbourhood Development Plans.
Portishead Branch Line	The 13.7 km section of railway, from Portishead, North Somerset, to Parson Street Junction in south Bristol. It comprises the Disused Railway and the Existing Freight Line
Principal Supply Points	A power connection for railway signalling equipment.
Public Rights of Way (PRoW)	Public rights of way are paths on which the public have a legally protected right to pass and re-pass.
Ramsar site	Wetlands of international importance designated under the Ramsar Convention.

Term	Meaning
Receptor	A defined individual environmental feature such as people, fauna and fora, land, air, water, that has potential to be affected by a project.
Resource	A defined but generally collective environmental feature usually associated with soil, water, air, climatic factors, landscape, material assets, including the architectural and archaeological heritage that has potential to be affected by a project.
River Avon Tow Path	The route runs parallel to the River Avon from the M5 Avonmouth bridge to Ashton and is included as part of NCN (Sustrans National Cycle Network) route 41.
Scenario	A defined situation or series of events.
Scoping	The process of identifying the issues to be addressed a study. Environmental scoping defines the brief for the environmental impact assessment of a proposed development. It is a method of ensuring that an assessment focuses on the important issues and avoids those that are considered to be not significant.
Secretary of State (“SoS”)	A Cabinet Minister in charge of a Government Department.
Sensitivity	The extent to which the receiving environment can accept and accommodate change without experiencing adverse effects.
Site of Nature Conservation Interest (“SNCI”)	A place designated by local authorities in England of substantive local nature conservation and value.
Site of Special Scientific Interest (“SSSI”)	A conservation designation denoting a protected area in the United Kingdom. SSSIs are the basic building block of site-based nature conservation legislation and most other legal nature/geological conservation designations in Great Britain are based upon them.
Special Area of Conservation (“SAC”)	Protected sites designated under the EC Habitats Directive. The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).
Special Protection Area (“SPA”)	Protected sites designated under the EC Directive on the Conservation of Wild Birds. Under the Directive, Member States have a duty to safeguard the habitats of migratory birds and certain particularly threatened birds.

Term	Meaning
Strategies: JSP, JTS, JLTP3, draft JLTP4, and SEP	The MetroWest Phase 1 project is included within the WofE regional strategies and planning documents including the Joint Spatial Plan, Joint Transport Study, Joint Local Transport Plan 3 and Strategic Economic Plan.
Supplementary Planning Guidance	These are documents which provide greater detail and clarity on specific issues or policies within a Local Plan.
Watercourse	Includes all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows.
WebTAG	DfT's web-based multimodal guidance on appraising transport projects and proposals.
'the four West of England Councils' or 'the WofE Councils'	The four WofE Councils are Bath and North East Somerset (B&NES), Bristol City Council ("BCC"), North Somerset District Council ("NSDC") and South Gloucestershire Council ("SGC").
West of England Combined Authority ("WECA")	WECA is in control of strategic transport, housing and adult skills for BCC, B&NES and SGC but not North Somerset. Its political leader is the Metro Mayor.

Annex A
Figures

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N

WYE VALLEY & FOREST OF DEAN BATS SITES

WYE VALLEY WOODLANDS

WYE VALLEY & FOREST OF DEAN BATS SITES

SEVERN ESTUARY

SEVERN ESTUARY

SEVERN ESTUARY

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SEVERN ESTUARY

AVON GORGE WOODLANDS

BATH & BRADFORD ON AVON BATS

BATH & BRADFORD ON AVON BATS

BATH & BRADFORD ON AVON BATS

NORTH SOMERSET & MENDIP BATS

NORTH SOMERSET & MENDIP BATS

NORTH SOMERSET & MENDIP BATS

CHEW VALLEY LAKE

NORTH SOMERSET & MENDIP BATS

NORTH SOMERSET & MENDIP BATS

MENDIPS LIMESTONE GRASSLAND

MENDIPS LIMESTONE GRASSLAND

MENDIPS LIMESTONE GRASSLAND

MELLS VALLEY

MELLS VALLEY

Avon Gorge Woodlands SAC @ 1:50,000

The Portishead Branch Line (MetroWest Phase 1) DCO Scheme

KEY

- Radius 5km
- Radius 10km
- Radius 30km
- Existing Railway Line

Portishead Branch Line

- The Nationally Significant Infrastructure Project (NSIP) Works
- The Associated Development
- Section in Tunnel

Other Works

- Network Rail Permitted Development Rights

Internationally Designated Sites

- Internationally Designated Sites
- Special Area of Conservation Bat Sites (SAC)
- Special Protection Area (SPA)
- Ramsar

0 5 10
Kilometres

Rev	By	Chkd	Apprvd	Date	Description
ES-A	MPC	CW	CF	12/11/2019	First draft

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Project :
Portishead Branch Line (MetroWest Phase 1)

Drawing : Figure 1
European sites near the DCO Scheme
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn By :	Martin Costello	Date: 12/11/2019
Checked By :	Clare Williams	Date: 12/11/2019
Approved By :	Carolyn Francis	Date: 12/11/2019

Drawing No. : 674946 -001-070-A
Revision ES-A

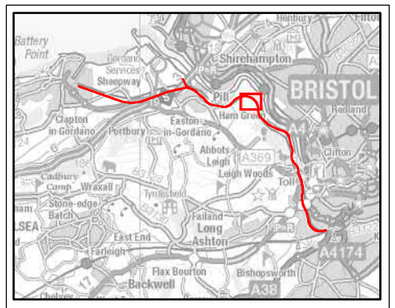
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N

NR rock face 14
5 rock bolts

CUTLINE



KEY

Portishead Branch Line

The Associated Development Works

General Arrangement

Order Limits

Micro Compound

Rock Face

Internationally Designated Sites

Special Area of Conservation (SAC)

SAC Habitats

Ancient/Semi-natural Woodland

Secondary Woodland

0 50 100

Metres

ES-A	MPC	CW	CF	12/11/2019	First draft
Rev	By	Chkd	Apprvd	Date	Description

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Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : ES – Appendix 9.12 HRA - Figure 2
DCO Scheme and Qualifying Features of the Avon Gorge Woodlands SAC
(Sheet 1 of 7)
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn By :	Martin Costello	Date: 12/11/2019
Checked By :	Clare Williams	Date: 12/11/2019
Approved By :	Carolyn Francis	Date: 12/11/2019

Drawing No. : 674946 -001-071-A

Revision ES-A

Drawing Scale : 1:2,500 @ A3

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N

NR rock face 14
5 rock bolts

CUTLINE

Miles Dock
Underbridge

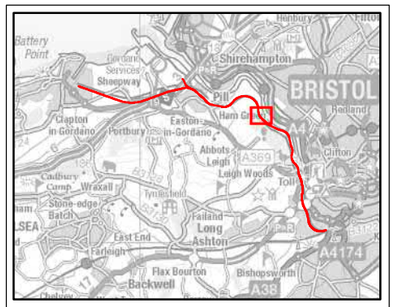
NR rock face 13
2 rock bolts

Sandstone Tunnel

NR rock face 12
2 rock bolts

CUTLINE

Underbridge No.6



KEY

Portishead Branch Line

The Associated Development Works

General Arrangement

Order Limits

Retaining Wall

Micro Compound

Rock Face

Internationally Designated Sites

Special Area of Conservation (SAC)

SAC Habitats

Ancient/Semi-natural Woodland

Secondary Woodland

0 50 100

Metres

ES-A	MPC	CW	CF	12/11/2019	First draft
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Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : ES – Appendix 9.12 HRA - Figure 2
DCO Scheme and Qualifying Features of the Avon Gorge Woodlands SAC
(Sheet 2 of 7)
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn By :	Martin Costello	Date: 12/11/2019
Checked By :	Clare Williams	Date: 12/11/2019
Approved By :	Carolyn Francis	Date: 12/11/2019

Drawing No. : 674946 -001-071-A

Revision ES-A

Drawing Scale : 1:2,500 @ A3

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N

CUTLINE

Underbridge No.6

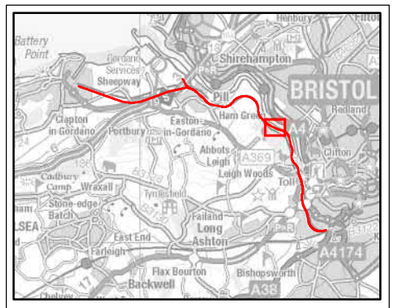
NR rock face 11
10 rock bolts

Area 11

Area 10

CUTLINE

NR rock face 10
10 rock bolts



KEY

Portishead Branch Line

- The Associated Development Works

General Arrangement

- Order Limits
- Retaining Wall
- Micro Compound
- Rock Face

Internationally Designated Sites

- Special Area of Conservation (SAC)

SAC Habitats

- Ancient/Semi-natural Woodland
- Secondary Woodland

0 50 100

Metres

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Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : ES – Appendix 9.12 HRA - Figure 2
DCO Scheme and Qualifying Features of the Avon Gorge Woodlands SAC
(Sheet 3 of 7)
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn By :	Martin Costello	Date: 12/11/2019
Checked By :	Clare Williams	Date: 12/11/2019
Approved By :	Carolyn Francis	Date: 12/11/2019

Drawing No. : 674946 -001-071-A

Revision ES-A

Drawing Scale : 1:2,500 @ A3

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N

CUTLINE

NR rock face 10
10 rock bolts

Area 9

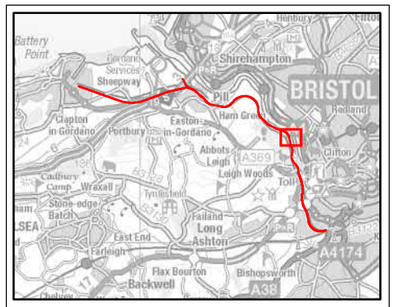
NR rock face 9
10 rock bolts

Area 8

NR rock face 8
10 rock bolts

Area 7
Rock catch fence

CUTLINE



KEY

Portishead Branch Line

The Associated Development Works

General Arrangement

Order Limits

Retaining Wall

Micro Compound

Rock Face

Internationally Designated Sites

Special Area of Conservation (SAC)

SAC Habitats

Ancient/Semi-natural Woodland

Secondary Woodland

0 50 100

Metres

Rev	By	Chkd	Apprvd	Date	Description
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Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : ES – Appendix 9.12 HRA - Figure 2
DCO Scheme and Qualifying Features of the Avon Gorge Woodlands SAC
(Sheet 4 of 7)
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn By :	Martin Costello	Date: 12/11/2019
Checked By :	Clare Williams	Date: 12/11/2019
Approved By :	Carolyn Francis	Date: 12/11/2019

Drawing No. : 674946 -001-071-A

Revision ES-A

Drawing Scale : 1:2,500 @ A3

Document Path: \\SWIN-FS-06\Consulting\wel\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\HRA\674946-006-010_HRA_Figure2_v2.mxd

N

CUTLINE

Area 6
Rock catch fence

NR rock face 7
10 rock bolts and
rock fence at proposed
fenceline postion

Area 5
5 rock bolts

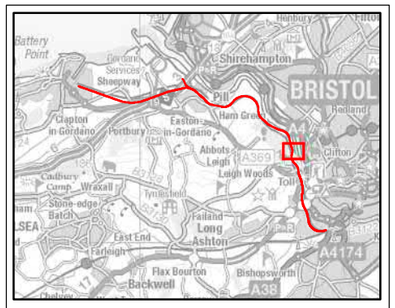
NR rock face 6
10 rock bolts

Clifton Bridgel No.2 Tunnel

Area 4

NR rock face 5
10 rock bolts

CUTLINE



KEY

Portishead Branch Line

- The Associated Development Works
- Section in Tunnel

General Arrangement

- Order Limits
- Retaining Wall
- Rock Face

Internationally Designated Sites

- Special Area of Conservation (SAC)

SAC Habitats

- Ancient/Semi-natural Woodland
- Grassland and Scrub
- SAC Grassland
- Secondary Woodland

0 50 100
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-A	MPC	CW	CF	12/11/2019	First draft

Client

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www.ch2m.com

Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : ES – Appendix 9.12 HRA - Figure 2
DCO Scheme and Qualifying Features of the Avon Gorge Woodlands SAC
(Sheet 5 of 7)
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn By :	Martin Costello	Date: 12/11/2019
Checked By :	Clare Williams	Date: 12/11/2019
Approved By :	Carolyn Francis	Date: 12/11/2019

Drawing No. : 674946 -001-071-A

Revision ES-A

Drawing Scale : 1:2,500 @ A3

Document Path: \\SWIN-FS-06\Consulting\wel\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\HRA\674946-006-010_HRA_Figure2_v2.mxd

N

CUTLINE

Area 3

NR rock face 4
10 rock bolts

Valley
Underbridge

NR rock face 3
10 rock bolts

Area 2
Rock catch fence

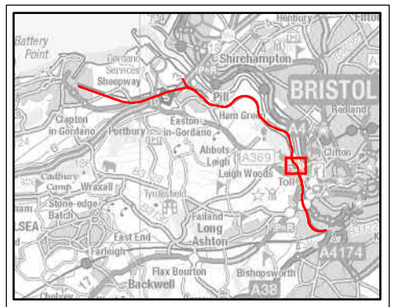
Clifton Bridge No.1 Tunnel

Area 1A

NR rock face 2

Area 1
5 rock bolts

CUTLINE



KEY

Portishead Branch Line

- The Associated Development Works
- Section in Tunnel

General Arrangement

- Order Limits
- Retaining Wall
- Micro Compound
- Rock Face

Internationally Designated Sites

- Special Area of Conservation (SAC)

SAC Habitats

- Ancient/Semi-natural Woodland
- SAC Grassland
- Secondary Woodland

0 50 100
Metres

ES-A	MPC	CW	CF	12/11/2019	First draft
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DCO Scheme and Qualifying Features of the Avon Gorge Woodlands SAC
(Sheet 6 of 7)
APFP Regulation 5(2)(a) and 5(2)(g)

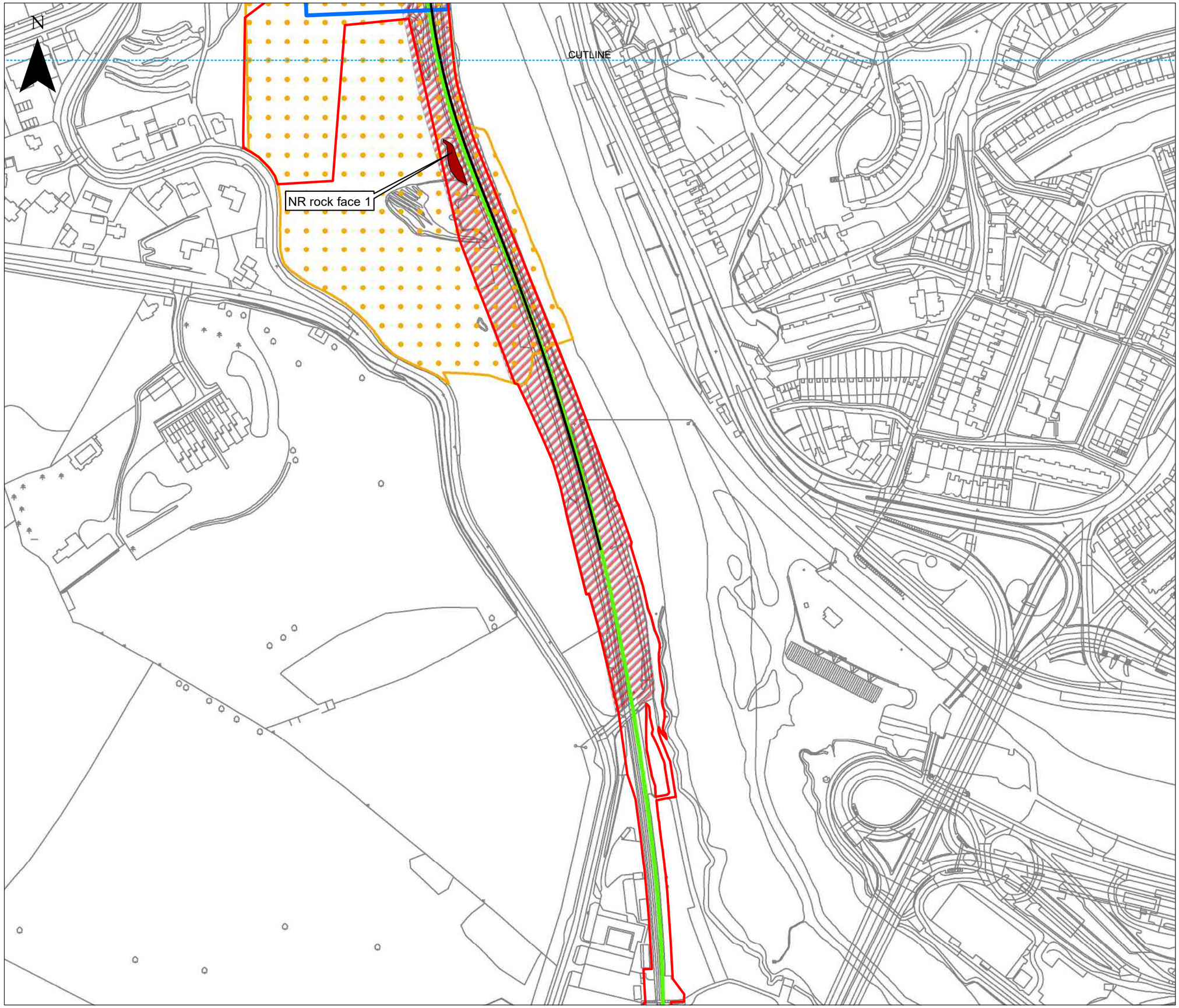
Drawn By :	Martin Costello	Date: 12/11/2019
Checked By :	Clare Williams	Date: 12/11/2019
Approved By :	Carolyn Francis	Date: 12/11/2019

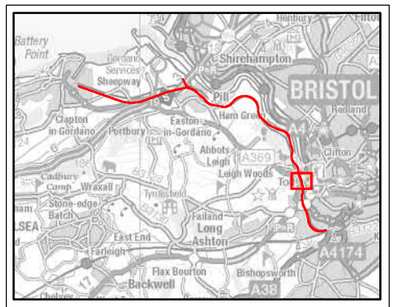
Drawing No. : 674946 -001-071-A

Revision ES-A

Drawing Scale : 1:2,500 @ A3

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KEY

Portishead Branch Line

The Associated Development Works

General Arrangement

Order Limits

Retaining Wall

Rock Face

Internationally Designated Sites

Special Area of Conservation (SAC)

SAC Habitats

Secondary Woodland

0 50 100

Metres

ES-A	MPC	CW	CF	12/11/2019	First draft
Rev	By	Chkd	Apprvd	Date	Description

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DCO Scheme and Qualifying Features of the Avon Gorge Woodlands SAC
(Sheet 7 of 7)
APFP Regulation 5(2)(a) and 5(2)(g)

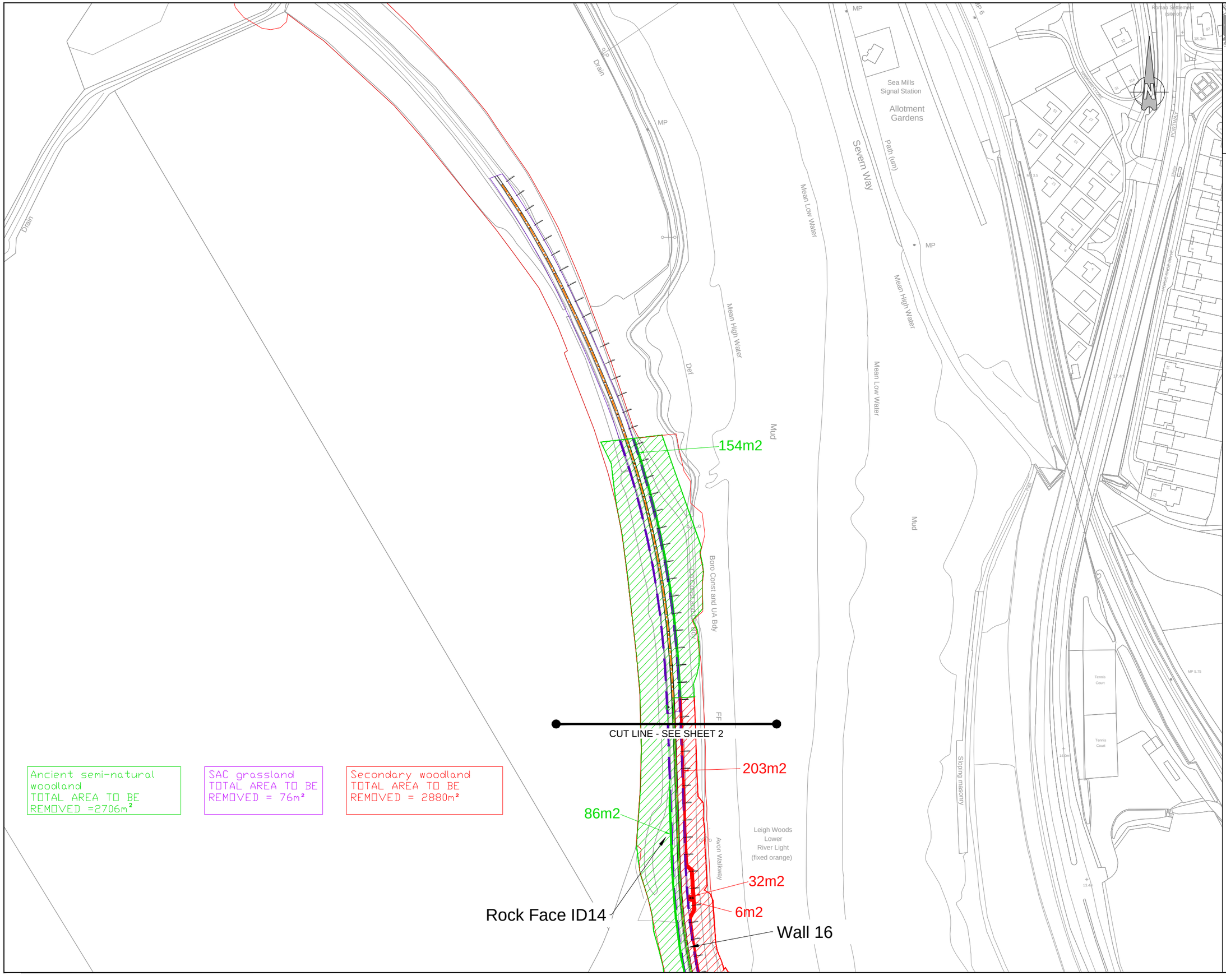
Drawn By :	Martin Costello	Date: 12/11/2019
Checked By :	Clare Williams	Date: 12/11/2019
Approved By :	Carolyn Francis	Date: 12/11/2019

Drawing No. : 674946 -001-071-A

Revision ES-A

Drawing Scale : 1:2,500 @ A3

Document Path: \\SWIN-FS-06\Consulting\we\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\HRA\674946-006-010_HRA_Figure2_v2.mxd


Drain
Drain
MP
Mean Low Water
Mean High Water
Def
Mud
154m2
Boro Const and UA Bdy
Avon Walkway
Leigh Woods
Lower
River Light
(fixed orange)
CUT LINE - SEE SHEET 2
203m2
86m2
32m2
6m2
Rock Face ID14
Wall 16
Ancient semi-natural woodland TOTAL AREA TO BE REMOVED =2706m²
SAC grassland TOTAL AREA TO BE REMOVED = 76m²
Secondary woodland TOTAL AREA TO BE REMOVED = 2880m²
Sea Mills Signal Station
Allotment Gardens
Severn Way
Path (um)
Mean High Water
Mean Low Water
Mud
Stepping masonry
Portbury Shore
Portbury Hundred
Tennis Court
Tennis Court
Portbury Shore
Portbury Hundred
Portbury Shore
Portbury Hundred
Portbury Shore
Portbury Hundred

CUT LINE - SEE SHEET 1

203m2

86m2

Leigh Woods
Lower
River Light
(fixed orange)

Avon Walkway

32m2

6m2

Rock Face ID14

Wall 16

29m2

22m2

Leigh Woods
Upper
River Light
(fixed orange)

22m2

Miles Dock Underbridge

21m2

18m2

43m2

Mud

110m2

59m2

Leigh Woods

Path (um)

Rock Face ID13

Sandstone tunnel

Wall 15

Rock Face ID12

Path (um)

Path (um)

Path (um)

Leigh Woods
Lower River Light
(Occulting White)

130m2

201m2

CUT LINE - SEE SHEET 3

Stopping masonry

Tennis Court

Tennis Court

MP 5.75

Sports Ground

Severn Way

N

0km 1km 2km

KEY

- Order Limits
- Ancient Semi-Natural Woodland
- Secondary Woodland
- SAC Grassland
- Ancient Semi-Natural Woodland - Removed
- Secondary Woodland - Removed
- SAC Grassland - Removed
- Extent of Rail Corridor Clear of Vegetation
- Centreline of Track

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0 10 20 30 40 50 60 70 80 90 100

SCALE 1:1000 (A1) METRES

Rev	By	Chkd	Apprvd	Date	Description
A	ACW	CW	CF	12/11/19	Order limits and drawing no. added

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Project

Portishead Branch Line

(MetroWest Phase1)

Drawing

Figure 3 Habitat Loss for Fences, Steps, Structures and Signals Within The Avon Gorge Woodlands SAC
Sheet 2 of 8
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn by:	MMS	Date:	18/07/2019
Checked by:	CW	Date:	18/07/2019
Approved by:	CFF	Date:	18/07/2019

Drawing No. 674946.BJ.35.01.301

Revision (A)

Drawing Scale: 1:2000 @ A3

Drawing file path & name: T:\AAA-UNDSCAP\EM\ex Sandersons\Projects\Bristol - Avon Gorge - Scheduled\Feb 2018\26\2007 - ACAD Plans\ Figure 3 - Habitat Loss 674946.BJ.35.01.301to307.dwg

Wall 15

CUT LINE - SEE SHEET 2

m2

130m2

Wall 15

33m2

73m2

34m2

25m2

140m2

22m2

Wall 14

470m2

213m2

Quarry
Underbridge 6

Rock Face ID11

50m2

29m2

183m2

CUT LINE - SEE SHEET 4

58m2

Quarry Underbridge 5

Avon Heights

Avon Gorge

Leigh Woods
(Nature Conservancy Council)

Leigh Woods
Lower River Light
(Occulting White)

Leigh Woods
Upper River Light
(Occulting White)

PORTWAY

Severn Way

Mud

Pond

Track

Path (um)

Mean High Water

N

0km 1km 2km

KEY

- Order Limits
- Ancient Semi-Natural Woodland
- Secondary Woodland
- SAC Grassland
- Ancient Semi-Natural Woodland - Removed
- Secondary Woodland - Removed
- SAC Grassland - Removed
- Extent of Rail Corridor Clear of Vegetation
- Centreline of Track

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0 10 20 30 40 50 60 70 80 90 100
SCALE 1:1000 (A1) METRES

Rev	By	Chkd	Apprvd	Date	Description
A	ACW	CW	CF	12/11/19	Order limits and drawing no. added

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Project
Portishead Branch Line
(MetroWest Phase1)

Drawing
Figure 3 Habitat Loss for Fences, Steps, Structures and Signals Within The Avon Gorge Woodlands SAC
Sheet 3 of 8
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn by:	MMS	Date:	18/07/2019
Checked by:	CW	Date:	18/07/2019
Approved by:	CFF	Date:	18/07/2019

Drawing No.	Revision
674946.BJ.35.01.302	(A)

Drawing Scale: 1:2000 @ A3

Drawing file path & name : T:\AA\LAND\SCAPE\Mike Sanderson\Projects\Bristol - Avon Gorge - Scrbst\Feb 2019\200307 - ACAD Plans\ Figure 3 - Habitat Loss 674946.BJ.35.01.302 rb307.dwg

50m2
193m2
29m2
Wall 13
183m2
CUT LINE - SEE SHEET 3
58m2
104m2
Quarry Underbridge 5
42m2
41m2
Wall 11
Rock Face ID10
19m2
235m2
24m2
22m2
Rock Face ID09
Wall 10
Quarry Underbridge 3
73m2
40m2
Wall 9
188m2
Rock Face ID08
375m2
CUT LINE - SEE SHEET 5
Leigh Woods
(Nature Conservancy Council)
Avon Gorge
River Avon
Black Rocks
Rifle Range
Obelisk
Pumping Station
Clifton Down Tunnel
PORTWAY
Mud
Path (um)
Track
Cave
Black Rock Rivers Light (fixed yellow)
Mean High Water
DW
MHW
MLW
SM
0km 1km 2km

KEY

- Order Limits
- Ancient Semi-Natural Woodland
- Secondary Woodland
- SAC Grassland
- Ancient Semi-Natural Woodland - Removed
- Secondary Woodland - Removed
- SAC Grassland - Removed
- Extent of Rail Corridor Clear of Vegetation
- Centreline of Track

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0 10 20 30 40 50 60 70 80 90 100
SCALE 1:1000 (A1) METRES

Rev	By	Chkd	Apprvd	Date	Description
A	ACW	CW	CF	12/11/19	Order limits and drawing no. added

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(MetroWest Phase1)

Drawing
Figure 3 Habitat Loss for Fences, Steps, Structures and Signals Within The Avon Gorge Woodlands SAC
Sheet 4 of 8
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn by:	MMS	Date:	18/07/2019
Checked by:	CW	Date:	18/07/2019
Approved by:	CFF	Date:	18/07/2019

Drawing No. 674946.BJ.35.01.303
Revision (A)
Drawing Scale: 1:2000 @ A3

Drawing file path & name: T:\AAA-LAND\SC\APE\Mike Sanderson\Projects\Bristol - Avon Gorge - Sorbus\Feb 2019\8.2007 - ACAD Plans\Figure 3 - Habitat Loss 674946.BJ.35.01.300 to307.dwg

CUT LINE - SEE SHEET 4

30m2

Working space for works to Quarry Underbridge 2

7m2

Wall 9

32m2

20m2

25m2

23m2

Quarry Underbridge 2

25m2

53m2

Wall 8

27m2

Rock Face ID07

Quarry Underbridge 1

49m2

Wall 7

Rock Face ID06

Rock Face ID05

CUT LINE - SEE SHEET 6

Path (um)

Avon Gorge

River Avon

Clifton Down

Cleeve Quarry River Light (fixed yellow)

Car Park

El Sub Sta

Pumping Station

Mud

FORTWAY

Bollard



KEY

- Order Limits
- Ancient Semi-Natural Woodland
- Secondary Woodland
- SAC Grassland
- Ancient Semi-Natural Woodland - Removed
- Secondary Woodland - Removed
- SAC Grassland - Removed
- Extent of Rail Corridor Clear of Vegetation
- Centreline of Track

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0 10 20 30 40 50 60 70 80 90 100

SCALE 1:1000 (A1) METRES

Rev	By	Chkd	Apprvd	Date	Description
A	ACW	CW	CF	12/11/19	Order limits and drawing no. added

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Project

Portishead Branch Line

(MetroWest Phase1)

Drawing

Figure 3 Habitat Loss for Fences, Steps, Structures and Signals Within The Avon Gorge Woodlands SAC
Sheet 5 of 8
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn by:	MMS	Date:	18/07/2019
Checked by:	CW	Date:	18/07/2019
Approved by:	CFF	Date:	18/07/2019

Drawing No. 674946.BJ.35.01.304

Revision (A)

Drawing Scale: 1:2000 @ A3

Drawing file path & name: T:\AA\LANDSCAPE\Mike Sanderson\Projects\Bristol - Avon Gorge - Scrbst\Feb 2019\20007 - ACAD Plates\ Figure 3 - Habitat Loss 674946.BJ.35.01.304 to307.dwg

Rock Face ID05

CUT LINE - SEE SHEET 5

Wall 6

352m2

193m2

39m2

4m2

Underbridge

36m2

16m2

71m2

Wall 5

Rock Face ID04

18m2

3m2

118m2

25m2

Valley Underbridge

49m2

107m2

Wall 4

21m2

27m2

6m2

Wall 3

Rock Face ID03

Rock Face ID02

CUT LINE - SEE SHEET 7

Wall 2

Stokeleigh Camp

Nightingale Valley

Avon Gorge

River Avon

Clifton Down

St Vincent's Rocks

Observatory Hill Fort

Clifton Suspension Bridge

Leighwoods

Ardmore

Telford House

Avon Gorge Woodlands (Nature Conservancy Council)

Round Point River Light (Fixed Yellow)

Nightingale Valley River Light (Occulting Green)

Bridge Valley River Light (Fixed Yellow)

Jack's Hole

Giant's Cave

Clifton Observatory

Engineers House

Promenade House

Path (um)

NORTH ROAD

HOTWELL ROAD

PORTWAY

Mean High Water

Mud

Trees

100.6m

KEY

- Order Limits
- Ancient Semi-Natural Woodland
- Secondary Woodland
- SAC Grassland
- Ancient Semi-Natural Woodland - Removed
- Secondary Woodland - Removed
- SAC Grassland - Removed
- Extent of Rail Corridor Clear of Vegetation
- Centreline of Track

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0 10 20 30 40 50 60 70 80 90 100

SCALE 1:1000 (A1) METRES

Rev	By	Chkd	Apprvd	Date	Description
A	ACW	CW	CF	12/11/19	Order limits and drawing no. added

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Project

Portishead Branch Line

(MetroWest Phase1)

Drawing

Figure 3 Habitat Loss for Fences, Steps, Structures and Signals Within The Avon Gorge Woodlands SAC Sheet 6 of 8

APFP Regulation 5(2)(a) and 5(2)(g)

Drawn by: MMS Date: 18/07/2019

Checked by: CW Date: 18/07/2019

Approved by: CFF Date: 18/07/2019

Drawing No. 674946.BJ.35.01.305

Revision (A)

Drawing Scale: 1:2000 @ A3

Drawing file path & name: T:\AA\ANBC\APEM\Mike Sanderson\Projects\Bristol - Avon Gorge - Status\Feb 2019\8200? - ACAD Plans\Figure 3 - Habitat Loss 674946.BJ.35.01.305 ts807.dwg

CUT LINE - SEE SHEET 6

Rock Face ID02

Wall 2

Wall 1

Rock Face ID01

464m2

CUT LINE - SEE SHEET 8



KEY

- Order Limits
- Ancient Semi-Natural Woodland
- Secondary Woodland
- SAC Grassland
- Ancient Semi-Natural Woodland - Removed
- Secondary Woodland - Removed
- SAC Grassland - Removed
- Extent of Rail Corridor Clear of Vegetation
- Centreline of Track

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SCALE 1:1000 (A1) METRES

Rev	By	Chkd	Apprvd	Date	Description
A	ACW	CW	CF	12/11/19	Order limits and drawing no. added

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Project

Portishead Branch Line

(MetroWest Phase1)

Drawing

Figure 3 Habitat Loss for Fences, Steps, Structures and Signals Within The Avon Gorge Woodlands SAC
Sheet 7 of 8
APFP Regulation 5(2)(a) and 5(2)(g)

Drawn by:	MMS	Date:	18/07/2019
Checked by:	CW	Date:	18/07/2019
Approved by:	CFF	Date:	18/07/2019

Drawing No. 674946.BJ.35.01.306

Revision (A)

Drawing Scale: 1:2000 @ A3

Drawing file path & name: T:\AA\LANDSCAPE\Mike Sanders\Projects\Bristol - Avon Gorge - Sch\sd\Feb 2019\2007 - ACAD Plans\Figure 3 - Habitat Loss 674946.BJ.35.01.306 (sd2007).dwg

CUT LINE - SEE SHEET 7

Clifton Overbridge

Cumberland Basin

Brunel Lock

Swing-bridge

Sluice

Cumberland Road Swing Bridge

Cumberland Piazza

Car Park

Pumping Station

The Create Environment Centre

Bristol Record Office

Police Horse and Dog Training Centre

Allotment Gardens

Nursery

Pond

Mud

Rivers Avon (New Cut)

Ashton Avenue Bridge

Avon Bridge

Primrose Bridge

Brunel Way

Cumberland Basin Road

Brunel Lock Road

Hotwell Road

Clifton Down Road

Merchants Road

Sloping masonry

Main High Water

Main Low Water

MLW

MHW

MLW

Pond

Lower Court Gardens

Allotment Gardens

Nursery

Pumping Station

El Sub Sta

Mud

Sluice

Sloping masonry

Main High Water

Main Low Water

MLW

MH

Annex B
European Site Data Sheets

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0012734**

SITENAME **Avon Gorge Woodlands**

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- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0012734

1.3 Site name

Avon Gorge Woodlands

1.4 First Compilation date	1.5 Update date
1996-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1996-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.633611111	51.46388889

2.2 Area [ha]:

151.07

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
6210			6.93		G	C	C	A	C
9180	X		105.75		M	B	C	A	B

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site					Site assessment	
		Scientific									

G	Code	Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
M	1304	Rhinolophus ferrumequinum			p				P	DD	D			
M	1303	Rhinolophus hipposideros			p				P	DD	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N08	4.0
N09	4.0
N16	70.0
N17	5.0
N19	5.0
N22	10.0
N10	2.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sedimentary,nutrient-poor,basic,limestone 2 Terrestrial: Geomorphology and landscape: lowland,crags/ledges,slope,valley,caves

4.2 Quality and importance

Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which the area is considered to support a significant presence. Tilio-Acerion forests of slopes, screes and ravines for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures	Pollution (optional)	inside/outside [i|o|b]

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]

	[code]	[code]	
H	I01		B
H	M02		B
H	K04		I
H	A04		I
H	G01		I

H	A02		I
H	B02		I
H	A04		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/3212324
http://publications.naturalengland.org.uk/category/6490068894089216

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK01	11.5	UK04	100.0		

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

X	Yes	Name: Avon Gorge Woodlands: The Leigh Woods National Nature Reserve (NNR) Management Plan provides management infomation related to this site. This is available from Natural England. Link:
	No, but in preparation	
	No	

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0013030**

SITENAME **Severn Estuary/ Môr Hafren**

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- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0013030

1.3 Site name

Severn Estuary/ Môr Hafren

1.4 First Compilation date	1.5 Update date
2007-08	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	2007-08
Date site confirmed as SCI:	2008-12
Date site designated as SAC:	2010-12
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.978055556	51.46861111

2.2 Area [ha]:

73714.11

2.3 Marine area [%]

98.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKL2	East Wales
UKK2	Dorset and Somerset
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area
UKZZ	Extra-Regio

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
1110			11779.51		G	C	C	B	C
1130			73677.25		G	A	A	B	B
1140			20271.38		G	A	B	B	B
1170			1474.28		P	C	C	A	C
1310						D			
1320			191.66		G	D			
1330			656.06		G	A	B	B	A

2110						D			

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
F	1102	Alosa alosa			p				P	DD	D			
F	1103	Alosa fallax			p				P	DD	A	B	C	A
F	1099	Lampetra fluviatilis			p				P	DD	C	B	C	B
F	1095	Petromyzon marinus			p				P	DD	C	A	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N03	1.0
N02	99.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: mud,clay,shingle,sedimentary,sand,peat 2 Terrestrial: Geomorphology and landscape: coastal 3 Marine:

Geology: sandstone/mudstone,pebble,sand,peat,gravel,shingle,sedimentary,cobble,biogenic reef,limestone/chalk,mud 4 Marine: Geomorphology: intertidal sediments (including sandflat/mudflat),estuary,subtidal rock (including rocky reefs),subtidal sediments (including sandbank/mudbank),intertidal rock,cliffs,pools,tidal rapids,islands,open coast (including bay),islands

4.2 Quality and importance

Sandbanks which are slightly covered by sea water all the time for which the area is considered to support a significant presence. Estuaries for which this is considered to be one of the best areas in the United Kingdom. Mudflats and sandflats not covered by seawater at low tide for which this is considered to be one of the best areas in the United Kingdom. Reefs for which the area is considered to support a significant presence. Atlantic salt meadows (Glauco-Puccinellietalia maritimae) for which this is considered to be one of the best areas in the United Kingdom. Petromyzon marinus for which this is considered to be one of the best areas in the United Kingdom. Lampetra fluviatilis for which this is considered to be one of the best areas in the United Kingdom. Alosa fallax for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	E06		B
H	M01		B
H	J02		B
H	G01		I
H	A02		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A04		I
H	A02		I
M	G03		B
H	D05		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. The Natural Resources Wales weblink below provides access to information on its designated sites. Detailed information about this Natura 2000 site can be accessed via the Management Plan link provided in Section 6.2. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-s

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	22.7	UK00	77.3	UK01	3.4

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural Resources Wales
Address:	
Email:	

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

[X] Yes Name: SEVERN ESTUARY / MÔR HAFREN
Link:
https://naturalresources.wales/media/673887/severn-estuary-sac-spa-and-ramsar-reg-33-advice-from-ne-and-ccw-jur

[ ] No, but in preparation

[ ] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Protection Areas under the EC Birds Directive.

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Protection Areas (SPAs) in the United Kingdom is available from the SPA home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SPAs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK9015022**

SITENAME **Severn Estuary**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
A	UK9015022

1.3 Site name

Severn Estuary

1.4 First Compilation date	1.5 Update date
1995-07	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

1.7 Site indication and designation / classification dates

Date site classified as SPA:	1995-07
National legal reference of SPA designation	Regulations 12A and 13-15 of the Conservation Habitats and Species Regulations 2010, (http://www.legislation.gov.uk/uksi/2010/490/contents/made) as amended by The Conservation of Habitats and Species (Amendment) Regulations 2011 (http://www.legislation.gov.uk/uksi/2011/625/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-3.049166667	51.22472222

2.2 Area [ha]:

24487.91

2.3 Marine area [%]

90.3

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK2	Dorset and Somerset
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area
UKL2	East Wales
UKL1	West Wales and The Valleys

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A051	Anas strepera			w	282	282	i		G	B		C	
B	A394	Anser albifrons albifrons			w	2664	2664	i		G	A		B	
B	A672	Calidris alpina alpina			w	44624	44624	i		G	B		C	
B	A037	Cygnus columbianus bewickii			w	280	280	i		G	B		C	
B	A048	Tadorna tadorna			w	3330	3330	i		G	B		C	
B	A162	Tringa totanus			w	2330	2330	i		G	B		C	

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

3.3 Other important species of flora and fauna (optional)

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
B	WATR	Waterfowl assemblage			84317	84317	i						X	

- **Group:** A = Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P = Plants, R = Reptiles
- **CODE:** for Birds, Annex IV and V species the code as provided in the reference portal should be used in addition to the scientific name
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Unit:** i = individuals, p = pairs or other units according to the standard list of population units and codes in accordance with Article 12 and 17 reporting, (see reference portal)
- **Cat.:** Abundance categories: C = common, R = rare, V = very rare, P = present
- **Motivation categories: IV, V:** Annex Species (Habitats Directive), **A:** National Red List data; **B:** Endemics; **C:** International Conventions; **D:** other reasons

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N02	89.0
N03	6.0
N14	1.0
N04	4.0
Total Habitat Cover	100

Other Site Characteristics

3 Marine:
Geology: limestone/chalk,sandstone/mudstone,clay,shingle,sedimentary,mud,sand,cobble,peat,gravel,biogenic reef 4 Marine: Geomorphology: islands,intertidal rock,subtidal rock (including rocky reefs),tidal rapids,intertidal sediments (including sandflat/mudflat),open coast (including bay),subtidal sediments (including sandbank/mudbank),pools,cliffs,estuary

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Cygnus columbianus bewickii (Western Siberia/North-eastern & North-western Europe) 3.9% of the GB population 5 year peak mean 1991/92-1995/96 ARTICLE 4.2 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Anas strepera (North-western Europe) 0.9% of the population 5 year peak mean 1991/92-1995/96 Anser albifrons albifrons (North-western Siberia/North-eastern & North-western Europe) 0.4% of the population 5 year peak mean 1991/92-1995/96 Calidris alpina alpina (Northern Siberia/Europe/Western Africa) 3.3% of the population 5 year peak mean 1991/92-1995/96 Tadorna tadorna (North-western Europe) 1.1% of the population 5 year peak mean 1991/92-1995/96 Tringa totanus (Eastern Atlantic - wintering) 1.3% of the population 5 year peak mean 1991/92-1995/96 ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS Over winter the area regularly supports: 84317 waterfowl (5 year peak mean 1991/92-1995/96) Including: Cygnus columbianus bewickii , Tadorna tadorna , Anas strepera , Calidris alpina alpina , Tringa totanus

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	G01		I
H	E06		B
H	A02		I
H	M01		B
H	J02		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A04		I
H	D05		I
H	A02		I
M	G03		B
H	A04		I
H	A02		I
H	A03		I
H	A03		I
H	D05		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. The Natural Resources Wales weblink below provides access to information on its designated sites. Detailed information about this Natura 2000 site can be accessed via the Management Plan link provided in Section 6.2. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-s

http://publications.naturalengland.org.uk/category/3212324
http://publications.naturalengland.org.uk/category/6490068894089216

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]

Code	Cover [%]	Code	Cover [%]
UK01	9.0	UK04	100.2

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

Organisation:	Natural Resources Wales
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [X] Yes — Name: SEVERN ESTUARY
  Link: https://naturalresources.wales/media/673887/severn-estuary-sac-spa-and-ramsar-reg-33-advice-from-ne-and-ccw-jur
- [ ] No, but in preparation
- [ ] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

Information Sheet on Ramsar Wetlands (RIS)

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

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 13 July 1995

3. Country:

UK (England/Wales)

4. Name of the Ramsar site:

Severn Estuary

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

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

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

a) Site boundary and area:

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

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

7. Map of site included:

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

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

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

b) Describe briefly the type of boundary delineation applied:

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

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

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

8. Geographical coordinates (latitude/longitude):

51 13 29 N 03 02 57 W

9. General location:

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

Nearest town/city: Bristol

In the south-west of the United Kingdom, between Wales and England

Administrative region: Bro Morgannwg/ Vale of Glamorgan; Caerdydd/ Cardiff; Casnewydd/ Newport; Avon; City of Bristol; Fynwy/ Monmouthshire; Gloucestershire; Gwent; North Somerset; Somerset; South Glamorgan; South Gloucestershire

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 24662.98

Min. -4
Max. 17
Mean 0

12. General overview of the site:

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

The estuary's classic funnel shape, unique in Britain, is a factor causing the Severn to have the second-largest tidal range in the world (after the Bay of Fundy, Canada). This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide swept sand and rock. The species-poor invertebrate community includes high densities of ragworms, lugworms and other invertebrates forming an important food source for passage and wintering waders.

A further consequence of the large tidal range is the extensive intertidal zone, one of the largest in the UK, comprising mudflats, sand banks, shingle, and rocky platforms.

Glassworts and annual sea-blite colonise the open mud, with beds of all three species of eelgrass *Zostera* occurring on more sheltered mud and sandbanks. Large expanses of common cord-grass also occur on the outer marshes. Heavily grazed saltmarsh fringes the estuary with a range of saltmarsh types present. The middle marsh sward is dominated by common saltmarsh-grass with typical associated species. In the upper marsh, red fescue and saltmarsh rush become more prominent.

13. Ramsar Criteria:

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

1, 3, 4, 5, 6, 8

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

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

Ramsar criterion 1

Due to immense tidal range (second-largest in world), this affects both the physical environment and biological communities.

Habitats Directive Annex I features present on the pSAC include:

H1110 Sandbanks which are slightly covered by sea water all the time

H1130 Estuaries

H1140 Mudflats and sandflats not covered by seawater at low tide

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

Ramsar criterion 3

Due to unusual estuarine communities, reduced diversity and high productivity.

Ramsar criterion 4

This site is important for the run of migratory fish between sea and river via estuary. Species include Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla*. It is also of particular importance for migratory birds during spring and autumn.

Ramsar criterion 8

The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla* use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad *Alosa alosa* and twaite shad *A. fallax* which feed on mysid shrimps in the salt wedge.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:
70919 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

Tundra swan , *Cygnus columbianus bewickii*, NW Europe	229 individuals, representing an average of 2.8% of the GB population (5 year peak mean 1998/9-2002/3)
Greater white-fronted goose , *Anser albifrons albifrons*, NW Europe	2076 individuals, representing an average of 35.8% of the GB population (5 year peak mean for 1996/7-2000/01)
Common shelduck , *Tadorna tadorna*, NW Europe	3223 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)
Gadwall , *Anas strepera strepera*, NW Europe	241 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)
Dunlin , *Calidris alpina alpina*, W Siberia/W Europe	25082 individuals, representing an average of 1.8% of the population (5 year peak mean 1998/9-2002/3)
Common redshank , *Tringa totanus totanus*,	2616 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species regularly supported during the breeding season:

Lesser black-backed gull , *Larus fuscus graellsii*, W Europe/Mediterranean/W Africa	4167 apparently occupied nests, representing an average of 2.8% of the breeding population (Seabird 2000 Census)

Species with peak counts in spring/autumn:

Ringed plover , *Charadrius hiaticula*, Europe/Northwest Africa	740 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Eurasian teal , *Anas crecca*, NW Europe	4456 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)
Northern pintail , *Anas acuta*, NW Europe	756 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.
See Sections 21/22 for details of noteworthy species
Details of bird species occuring at levels of National importance are given in Section 22

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

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

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

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16. Physical features of the site:

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

Soil & geology	alluvium, basic, biogenic reef, clay, cobble, gravel, limestone/chalk, mud, neutral, nutrient-rich, peat, sand, sandstone/mudstone, sedimentary, shingle
Geomorphology and landscape	cliffs, coastal, estuary, floodplain, intertidal rock, intertidal sediments (including sandflat/mudflat), islands, lowland, open coast (including bay), pools, subtidal rock (including rocky reefs), subtidal sediments (including sandbank/mudbank), tidal rapids
Nutrient status	eutrophic
pH	circumneutral
Salinity	brackish / mixosaline, saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Cardiff, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/cardiff.html) Max. daily temperature: 14.3° C Min. daily temperature: 6.8° C Days of air frost: 33.0 Rainfall: 1111.7 mm Hrs. of sunshine: 1518.0

General description of the Physical Features:

The Severn Estuary is a large estuary with extensive intertidal mudflats and sandflats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The seabed is rock and gravel with subtidal sandbanks. The estuary's classic funnel shape, unique in the UK, is a factor causing the Severn to have the second-highest tidal range in the world. This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide-swept sand and rock. A further consequence of the large tidal range is an extensive intertidal zone, one of the largest in the UK.

17. Physical features of the catchment area:

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

The Severn Estuary is a large estuary with extensive intertidal mudflats and sandflats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The seabed is rock and gravel with subtidal sandbanks. The estuary's classic funnel shape, unique in the UK, is a factor causing the Severn to have the second-highest tidal range in the world. This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide-swept sand and rock. A further consequence of the large tidal range is an extensive intertidal zone, one of the largest in the UK.

18. Hydrological values:

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

Shoreline stabilisation and dissipation of erosive forces, Sediment trapping

19. Wetland types:

Inland wetland, Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	84.1
H	Salt marshes	4.7
D	Rocky shores	4.7
E	Sand / shingle shores (including dune systems)	4.4
Tp	Freshwater marshes / pools: permanent	1
B	Marine beds (e.g. sea grass beds)	0.9
F	Estuarine waters	0.2

20. General ecological features:

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

The large tidal range leads to strong tidal streams and high turbidity, producing communities characteristic of the extreme physical conditions of liquid mud and tide-swept sand and rock. Broad intertidal flats with areas of unstable sand and muddy flats support high densities of invertebrates. Intertidal rock platforms support a wide variety of invertebrate species. There are large areas of subtidal sand, rock and gravel with a variety of aquatic estuarine communities including *Sabellaria alveolata* reef. Areas of saltmarsh fringe the estuary, mostly grazed with a range of vegetation communities. There are gradual and stepped transitions between bare mudflat to upper marsh and grassland. Main vegetation types are: upper saltmarsh with *Festuca rubra* and *Juncus gerardii*; middle marsh dominated by *Puccinellia maritima* with *Glaux maritima* and *Triglochin maritima*; dense monocultures of *Spartina anglica* at the edge of the mudflats-brackish pools and depressions with *Phragmites australis* and *Bolboschoenus maritimus*.

Ecosystem services

21. Noteworthy flora:

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

Nationally important species occurring on the site.

Higher Plants.

Aster linosyris (nationally rare),

Alopecurus bulbosus, *Althaea officinalis*, *Bupleurum tenuissimum*, *Hordeum marinum*, *Lepidium latifolium*, *Petroselinum segetum*, *Puccinellia rupestris*, *Trifolium squamosum*, *Zostera marina/angustifolia*, *Zostera noltei* (all nationally scarce)

22. Noteworthy fauna:

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

Birds

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Herring gull , *Larus argentatus argentatus*, NW Europe and Iceland/W Europe)	1540 apparently occupied nests, representing an average of 1.1% of the GB population (Seabird 2000 Census)

Species with peak counts in spring/autumn:

Little egret , *Egretta garzetta*, West Mediterranean	17 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)
Ruff , *Philomachus pugnax*, Europe/W Africa	12 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9-2002/3)
Whimbrel , *Numenius phaeopus*, Europe/Western Africa	333 individuals, representing an average of 11.1% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Eurasian curlew , *Numenius arquata arquata*, N. a. arquata Europe (breeding)	2021 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank , *Tringa nebularia*, Europe/W Africa	26 individuals, representing an average of 4.3% of the GB population (5 year peak mean 1998/9-2002/3)
Species with peak counts in winter:	
Eurasian wigeon , *Anas penelope*, NW Europe	4658 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Northern shoveler , *Anas clypeata*, NW & C Europe	297 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9-2002/3)
Common pochard , *Aythya ferina*, NE & NW Europe	1118 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Water rail , *Rallus aquaticus*, Europe	11 individuals, representing an average of 2.4% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , *Tringa erythropus*, Europe/W Africa	10 individuals, representing an average of 7.3% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Species occurring at levels of international importance on the site.

Fish.

Alosa alosa (IUCN Red data book – threatened; Habitats Directive Annex II, Annex V (S1102)),
Alosa fallax (IUCN Red data book – threatened; Habitats Directive Annex II, Annex V (S1103))
Lampetra fluviatilis (IUCN Red data book – threatened; Habitats Directive Annex II (S1099)),
Petromyzon marinus (Habitats Directive Annex II (S1095))

Nationally important species occurring on the site.

Invertebrates.

Tenellia adspersa (nationally rare); *Corophium lacustre* (nationally scarce); *Gammarus insensibilis* (nationally scarce)

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23. Social and cultural values:

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

Aesthetic
Archaeological/historical site
Environmental education/ interpretation

Fisheries production
Livestock grazing
Non-consumptive recreation
Scientific research
Sport fishing
Sport hunting
Tourism
Traditional cultural
Transportation/navigation

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

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

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
National/Crown Estate	+	
Private	+	+
Public/communal	+	+
Other	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	+
Fishing: commercial	+	+
Fishing: recreational/sport	+	+
Gathering of shellfish	+	
Bait collection	+	
Arable agriculture (unspecified)		+
Grazing (unspecified)	+	+
Permanent pastoral agriculture		+

Hunting: recreational/sport	+	+
Industrial water supply	+	
Industry	+	+
Sewage treatment/disposal	+	+
Harbour/port	+	+
Flood control	+	+
Mineral exploration (excl. hydrocarbons)	+	+
Mining/quarrying	+	+
Transport route	+	+
Urban development		+
Military activities	+	+

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

Explanation of reporting category:

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

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Dredging	1		+	+	+
Erosion	1		+		+
Recreational/tourism disturbance (unspecified)	1		+	+	

For category 2 factors only. What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Is the site subject to adverse ecological change? NO

27. Conservation measures taken:

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

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	+

National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	+
Management agreement	+	+
Site management statement/plan implemented	+	
Other	+	
Management plan in preparation	+	+

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

28. Conservation measures proposed but not yet implemented:

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

No information available

29. Current scientific research and facilities:

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

Contemporary.

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

Completed.

Flora and Fauna.
CCW/EN Marine Intertidal Phase 1 survey of the biotopes of the Severn Estuary in 2003/4
BTO Research report 335 for CCW/EN (November 2003). Low tide distribution of waterbirds of Severn Estuary SPA. Results of 2002/03 WeBS low tide counts and a historical analysis (Burton *et al*. 2003).
WWT Wetlands Advisory Service. Report for CCW (April 2003). Baseline bird monitoring of the River Severn.
Joint Nature Conservation Committee (1997) Subtidal biotope survey at mouth of the River Parrett.
Joint Nature Conservation Committee (1997) Upper estuary intertidal rocky shore survey.
Mettam, C (1997) *Biotopes in the subtidal sandbanks of the Severn estuary*. Report to English Nature

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

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

There are fixed interpretation panels and hides at Bridgwater Bay, Newport Wetlands Reserve, Flat Holm LNR and field centre. Interpretation boards at Black Rock.

31. Current recreation and tourism:

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

Activities, Facilities provided and Seasonality.
Walking, dog walking, and birdwatching are concentrated along the sea walls all the year round and on the saltmarsh and sandy beaches.

Bathing, beach recreation, including sand yachting and wind surfing are practised on the sandy beaches, mainly in the summer.

There are boat clubs/marinas in the sub-estuaries with sailing, motor boats, and jet skiing.

Angling is carried out from the shore and small boats. There is a certain amount of bait digging.

Wildfowling is carried out from September to February all around the Estuary; consents and further management measures are being addressed. There are agreed refuge areas for the birds.

32. Jurisdiction:

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

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

Head, Countryside Division, Welsh Assembly Government, Cathays Park, Cardiff, CF1 3NQ

33. Management authority:

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

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK / Site Safeguard Officer, International Designations, Countryside Council for Wales, Maes-y-Ffynnon, Penrhosgarnedd, Bangor, Gwynedd, LL57 2DW

34. Bibliographical references:

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

Site-relevant references

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
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NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**UK0030052**
SITENAME	**North Somerset and Mendip Bats**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0030052

1.3 Site name

North Somerset and Mendip Bats

1.4 First Compilation date	1.5 Update date
1998-03	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1998-03
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.746388889	51.28611111

2.2 Area [ha]:

555.93

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area
UKK2	Dorset and Somerset

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
4030			10.56		G	D			
6210			151.77		G	B	C	A	B
8310			10.01		G	C	C	B	C
9180	X		138.43		G	B	C	B	B

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
I	1065	Euphydryas (Eurodryas, Hypodryas) aurinia			p				P	DD	D			
M	1304	Rhinolophus ferrumequinum			p	101	250	i		M	B	A	C	A
M	1303	Rhinolophus hipposideros			p	101	250	i		M	C	B	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N23	1.0
N08	22.5
N16	30.0
N09	27.5
N19	19.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sedimentary,nutrient-poor,basic,limestone 2 Terrestrial: Geomorphology and landscape: hilly,lowland,caves

4.2 Quality and importance

Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which this is considered to be one of the best areas in the United Kingdom. Caves not open to the public for which the area is considered to support a significant presence. Tilio-Acerion forests of slopes, screes and ravines for

which this is considered to be one of the best areas in the United Kingdom. Rhinolophus ferrumequinum for which this is considered to be one of the best areas in the United Kingdom. Rhinolophus hipposideros for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	U		O
H	E06		B
H	B02		I
H	K04		I
H	A04		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A04		I
H	B02		I
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

☐ Yes

	No, but in preparation
X	No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
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3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
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B	Good	57
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D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
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1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
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1320	Spartina swards (Spartinion maritimae)	57
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1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
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2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
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4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
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3.1 Relative surface

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C	< 2%	58

3.1 Conservation status habitat

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3.1 Global grade habitat

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3.2 Population (abbreviated to 'Pop.' in data form)

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3.2 Conservation status species (abbreviated to 'Con.' in data form)

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A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Protection Areas under the EC Birds Directive.

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Protection Areas (SPAs) in the United Kingdom is available from the SPA home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SPAs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**UK9010041**
SITENAME	**Chew Valley Lake**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
A	UK9010041

1.3 Site name

Chew Valley Lake

1.4 First Compilation date	1.5 Update date
1985-07	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

1.7 Site indication and designation / classification dates

Date site classified as SPA:	1985-07
National legal reference of SPA designation	Regulations 12A and 13-15 of the Conservation Habitats and Species Regulations 2010, (http://www.legislation.gov.uk/uksi/2010/490/contents/made) as amended by The Conservation of Habitats and Species (Amendment) Regulations 2011 (http://www.legislation.gov.uk/uksi/2011/625/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.618611111	51.33388889

2.2 Area [ha]:

575.94

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A056	Anas clypeata			w	503	503	i		G	B		C	

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N07	6.0
N16	4.0
N10	7.0
N06	83.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: neutral,sedimentary,basic 2 Terrestrial: Geomorphology and landscape: valley,lowland

4.2 Quality and importance

ARTICLE 4.2 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Anas clypeata (North-western/Central Europe) 1.3% of the population 5 year peak mean 1991/92-1995/96

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	J02		B
H	G01		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/3212324
http://publications.naturalengland.org.uk/category/6490068894089216

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
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3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**UK0012727**
SITENAME	**Wye Valley Woodlands/ Coetiroedd Dyffryn Gwy**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	UK0012727

1.3 Site name

Wye Valley Woodlands/ Coetiroedd Dyffryn Gwy

1.4 First Compilation date	1.5 Update date
1996-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1996-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

Back to top

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.678611111	51.65777778

2.2 Area [ha]:

913.32

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKG1	Herefordshire, Worcestershire and Warwickshire
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area
UKL1	West Wales and The Valleys

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
6210			1.74		G	D			
8310			0.82		G	D			
9130			189.06		G	A	C	A	A
9180	X		421.04		G	A	B	A	A
91J0	X		21.01		G	B	C	A	A

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not

available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
M	1304	Rhinolophus ferrumequinum			p	11	50	i		M	D			
M	1303	Rhinolophus hipposideros			p	51	100	i		M	C	B	C	C

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N08	10.0
N17	0.7
N22	0.6
N23	1.5
N09	0.2
N16	87.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sandstone,acidic,basic,limestone,neutral,sedimentary 2 Terrestrial: Geomorphology and landscape: valley,crags/ledges,lowland,caves,slope

4.2 Quality and importance

Asperulo-Fagetum beech forests for which this is considered to be one of the best areas in the United Kingdom. Tilio-Acerion forests of slopes, screes and ravines for which this is considered to be one of the best areas in the United Kingdom. Taxus baccata woods of the British Isles for which this is considered to be one of

the best areas in the United Kingdom. Rhinolophus hipposideros for which the area is considered to support a significant presence.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	J03		B
H	I01		B
H	M02		B
H	I02		B
H	B02		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	D05		I
M	D05		I
H	B02		I
H	A02		I
M	K02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. The Natural Resources Wales weblink below provides access to information on its designated sites. Detailed information about this Natura 2000 site can be accessed via the Management Plan link provided in Section 6.2. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-s

http://publications.naturalengland.org.uk/category/3212324
http://publications.naturalengland.org.uk/category/6490068894089216

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0	UK01	9.8		

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural Resources Wales
Address:	
Email:	

Organisation:	Natural England

Address:

Email:

6.2 Management Plan(s):

An actual management plan does exist:

X	Yes	Name: WYE VALLEY WOODLANDS / COETIROEDD DYFFRYN GWY Link: https://www.naturalresources.wales/media/674402/Wye%20Valley%20Woods%20core%20plan%2015%20Nov%2007%
	No, but in preparation	
	No	

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
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B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

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Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

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More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**UK0014794**
SITENAME	**Wye Valley and Forest of Dean Bat Sites/ Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0014794

1.3 Site name

Wye Valley and Forest of Dean Bat Sites/ Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena

1.4 First Compilation date	1.5 Update date
1996-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1996-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

Back to top

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.5725	51.7375

2.2 Area [ha]:

144.82

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKL1	West Wales and The Valleys
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo
M	1323	Myotis bechsteini			p	1	5	i		M	D			
M	1304	Rhinolophus ferrumequinum			p	251	500	i		M	B	A	B	B
M	1303	Rhinolophus hipposideros			p	1001	10000	i		M	A	A	C	A

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with

some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N16	26.2
N23	73.8
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: limestone 2 Terrestrial: Geomorphology and landscape: lowland,valley,hilly

4.2 Quality and importance

Rhinolophus ferrumequinum for which this is considered to be one of the best areas in the United Kingdom. Rhinolophus hipposideros for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	J03		B
H	G01		I
H	J02		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	E04		I
H	D05		I
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. The Natural Resources Wales weblink below provides access to information on its designated sites. Detailed information about this Natura 2000 site can be accessed via the Management Plan link provided in Section 6.2. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/6490068894089216

https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-s

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural Resources Wales
Address:	
Email:	

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

[X] Yes Name: WYE VALLEY AND FOREST OF DEAN BAT SITES / SAFLEOEDD YSTLUMOD DYFFRYN FFOREST Y DDENA
Link:
https://www.naturalresources.wales/media/674312/Wye%20Valley%20Bats%20Core%20Plan%20TRK%2031%20Oct%

[ ] No, but in preparation

[ ] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
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M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

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NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

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Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

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Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**UK0030203**
SITENAME	**Mendip Limestone Grasslands**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	UK0030203

1.3 Site name

Mendip Limestone Grasslands

1.4 First Compilation date	1.5 Update date
2001-01	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

Date site proposed as SCI:	2001-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.859166667	51.29666667

2.2 Area [ha]:

415.24

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK2	Dorset and Somerset
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
4030			84.71		G	B	C	C	C
6210			158.21		G	A	C	A	B
8310			2.91		G	B	C	C	C
9180	X		19.93		G	B	C	C	C

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
M	1304	Rhinolophus ferrumequinum			p	11	50	i		M	C	B	C	C
M	1303	Rhinolophus hipposideros			p	11	50	i		M	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N09	38.0
N22	7.0
N16	10.0
N08	45.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: basic,sedimentary,limestone,nutrient-poor 2 Terrestrial: Geomorphology and landscape: hilly,escarpment,caves

4.2 Quality and importance

European dry heaths for which the area is considered to support a significant presence. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which this is considered to be one of the best areas in the United Kingdom. Caves not open to the public for which the area is considered to support a significant presence. Tilio-Acerion forests of slopes, screes and ravines for which the area is considered to support a significant presence. Rhinolophus ferrumequinum for which the area is considered to support a significant presence.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A02		I
H	K02		I
H	H04		B
H	K04		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	B02		I
H	A04		I
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**UK0012584**
SITENAME	**Bath and Bradford-on-Avon Bats**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0012584

1.3 Site name

Bath and Bradford-on-Avon Bats

1.4 First Compilation date	1.5 Update date
1996-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1996-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

Back to top

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.238611111	51.4175

2.2 Area [ha]:

106.45

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
6210			2.01		G	D			

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site					Site assessment			
G	Code	Scientific Name	S	NP	T	Size	Unit	Cat.	D.qual.	A|B|C|D	A|B|C		

						Min	Max				Pop.	Con.	Iso.	Glo.
M	1323	Myotis bechsteini			p	20	20	i		G	C	C	C	A
M	1304	Rhinolophus ferrumequinum			p	251	500	i		M	B	A	C	B
M	1303	Rhinolophus hipposideros			p	251	500	i		M	C	A	C	C

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N16	41.0
N23	55.0
N08	4.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: limestone,neutral,nutrient-poor,basic,sedimentary 2 Terrestrial: Geomorphology and landscape: valley,lowland,hilly,caves,crags/ledges

4.2 Quality and importance

Rhinolophus ferrumequinum for which this is considered to be one of the best areas in the United Kingdom. Rhinolophus hipposideros for which the area is considered to support a significant presence. Myotis bechsteini for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	G01		I
H	J03		B
H	U		O
H	E06		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A02		I
H	A04		I

H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

☐	Yes
☐	No, but in preparation
☒	No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

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C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
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7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
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9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**UK0012658**
SITENAME	**Mells Valley**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0012658

1.3 Site name

Mells Valley

1.4 First Compilation date	1.5 Update date
1996-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1996-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.491666667	51.22583333

2.2 Area [ha]:

28.77

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK2	Dorset and Somerset

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
6210			1.0		G	C	C	C	C
8310			10.17		G	B	C	C	C

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site					Site assessment	
		Scientific									

G	Code	Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
M	1323	Myotis bechsteini			p	1	5	i		M	D			
M	1304	Rhinolophus ferrumequinum			p	101	250	i		M	B	A	C	B
M	1303	Rhinolophus hipposideros			p	11	50	i		M	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N14	60.0
N23	25.0
N16	10.0
N10	5.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sedimentary,nutrient-rich,nutrient-poor,limestone,basic 2 Terrestrial: Geomorphology and landscape: hilly,caves,lowland,valley

4.2 Quality and importance

Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which the area is considered to support a significant presence. Caves not open to the public for which the area is considered to support a significant presence. Rhinolophus ferrumequinum for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	B02		I

H	U		O
H	G05		I
H	G01		I
H	A04		I

H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/3212324
http://publications.naturalengland.org.uk/category/6490068894089216

http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
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4060	Alpine and Boreal heaths	57
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5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
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6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
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N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

Annex C
Summary of Baseline Data Collection

Annex C: Summary of baseline surveys relevant to the HRA

Ecological feature	Survey type	Dates(s)	Methodology	Study area
Statutory sites	Desk Study	November 2018	MAGIC data	10 km search area for international designated sites; extended to 30 km for sites with horseshoe bats as a qualifying feature.
Non-statutory sites	Desk study	April 2014	Compiled from Bristol Regional Environmental Records Centre data	0.5km buffer from centreline of the railway for locally designated sites.
Protected and notable species	Desk study	April 2014, October 2015	Compiled from BRERC data, AWT, Natural England, National Trust, The FC, Avon Bat Group, and Bristol Bus Rapid Transit Line two report by Atkins for West of England Partnership.	0.5km buffer from centreline of the railway (2.5km for bats); Watercourses 250m from the centreline of the railway.
Habitats	Extended Phase 1 Habitat Survey (see ES Appendix 9.1, DCO Document Reference 6.25)	13th-14th March and 1st-2nd April 2014	Handbook for Phase 1 habitat survey (JNCC, 2010)	Along entire length of DCO Scheme (for Phase 1 Habitat Survey locations, see Figure 1 of ES Appendix 9.1, DCO Document Reference 6.25)
		29th July 2015		Clifton Bridge No. 1 Tunnel to the River Avon Tow Path access bridge
		7th June 2016		South Liberty Lane
		9th and 13th June 2016		Ashton Vale Road
		25th May 7th, 9th and 13th June 2016		Compound sites
		14th and 15th December 2016 and 1st and 3rd February 2017		Pre-selected areas in Portishead, Pill and Ashton

Annex C: Summary of baseline surveys relevant to the HRA

Ecological feature	Survey type	Dates(s)	Methodology	Study area
		13th and 28th March 2018		Pre-selected areas in Portishead, Pill, Portbury, Ham Green, Leigh Woods, and Ashton.
		9th May 2018		Former Quarry in the Avon Gorge adjacent to Quarry Bridge No. 2
		18th July 2018		Pre-selected areas in Portishead, Sheepway, and Gordano
		19th July 2019		Pre-defined areas in Leigh Woods which may be used as access routes and a site compound during construction.
	Botanical surveys (see ES Appendix 9.10, DCO Document Reference 6,25)	25th July 2015, 27th October 15th December 2016, 18th May and 18th July 2017	Visual search for protected, notable and invasive plant species using the look-see approach (Chapter 15, Hill et al., 2005)	Land owned by Network Rail within the Avon Gorge Woodlands SAC/SSSI and small area adjacent under different ownership which may be affected during construction (see Figure 1 of ES Appendix 9.10, DCO Document Reference 6,25)
		9th May 2018		Quarry 2
	Whitebeam surveys (see ES Appendix 9.10, DCO Document Reference 6,25)	2015	Identified and classified in accordance with the species conservation statues detailed in the 'World List of Threatened Trees'	Land owned by Network Rail within the Avon Gorge Woodlands SAC/SSSI and small area adjacent under different ownership which may be affected during construction
		2016 and 2017		Update to above and top-up surveys of areas not previously surveyed
	Whitebeam – planting sites scoping (see ES Appendix	18th May 2017		Avon Gorge

Annex C: Summary of baseline surveys relevant to the HRA

Ecological feature	Survey type	Dates(s)	Methodology	Study area
	9.11 AGVMP Ver. 02, DCO Document Reference 8.12)	18th June 2019	Professional judgement of qualified botanists	
		8 October 2019		Leigh Woods – survey of current condition of planted whitebeams
		29 June 2020		Red Oak Plantation in FC land
Bats	Roost surveys – Structure assessments (eDNA of droppings with respect of tunnels along Portbury Freight Line) (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	2014	Surveys conducted with reference to the Bat Conservation Trust's best practice guidelines (Collins ed., 2016).	Culverts and bridges
		15th October 2015		The four tunnels on the Portbury Freight Line
		18th July 2016		Two stone arches at Pill
		6th March 2018		Pill Station House at 7 Station Road
		15th and 16th August 2016 and 7th June 2018		Fourteen structures on Portbury Freight Line, small store building on adjacent towpath and underground bunker (Babcock's bunker)
		24th October 2018		Barns at Lodway Farm
	Roost surveys – Tree ground assessments (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	2014	Surveys conducted with reference to the Bat Conservation Trust's best practice guidelines (Collins ed., 2016).	Trees along the railways and/or those trees with canopy cover over the railway that have potential to be impacted by works
		2nd, 16th, 17th and 26th June and 7th July 2017		Avon Gorge - Woodland and trees within Network Rail land that are within the trackside management plan and may be subject to tree work.

Annex C: Summary of baseline surveys relevant to the HRA

Ecological feature	Survey type	Dates(s)	Methodology	Study area
		22nd July 2020		Trees within NR land along the Freight line between Clanage Road and the Bower Ashton crossing.
	Roost surveys – Tree climbing and endoscope surveys (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	11th and 12th March 2015	Surveys conducted with reference to the Bat Conservation Trust's best practice guidelines (Collins ed., 2016).	Eleven trees identified as having moderate to high bat roost potential
	Roost surveys – Structure emergence / re-entry surveys (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	June – September 2015	Surveys conducted with reference to the Bat Conservation Trust's best practice guidelines (Collins ed., 2016).	Six bridges and two culverts
		Dusk survey on 12th July and 13th September 2016		Avon Road Bridge between Avon Road and Lodway Close in Pill
		Dawn survey on 28th September 2016		Two stone arches at Pill Station
		Dusk survey on 21st May and 7th June 2018		Pill Station House at 7 Station Road
	Swarming surveys – Structures (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	September and October 2015	Visual surveys, surveyors equipped with an Elekon BatloggerM, Anabat SD1 or Petterson D240x bat detector	Tunnels on the Portbury Freight Line
	Bat activity transect surveys with 14 predetermined stopping points in 2014 and 10 predetermined stopping points in 2015 and 2016.	One survey per month from August to October 2014, Two surveys per month from May to August 2015 and in April 2016.	Surveys conducted with reference to the Bat Conservation Trust's best practice guidelines (Collins ed., 2016).	Following alignment of the route in the centre of the railway corridor

Annex C: Summary of baseline surveys relevant to the HRA

Ecological feature	Survey type	Dates(s)	Methodology	Study area
	(see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)			
	Static activity surveys (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	August – October 2014 and April - August 2015	Surveys conducted with reference to the Bat Conservation Trust's best practice guidelines (Collins ed., 2016).	Twenty-three predetermined locations along the disused railway line
		Seven nights per month between April – September 2016		Ten fixed locations
		Six or more nights at each portal between 19th August and 15th October 2015		Tunnels on the Portbury Freight Line
		Seven nights from 18th July 2016		Stone arches at Pill Station
		Monthly between May and October 2019		Along the freight line from Pill Viaduct to the junction with the disused line
	Trapping surveys (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	Two nights per month in June and July 2015 and five nights in June 2018	Avinet and Ecotone mist nets and Austbat 4m^2 double lined harp traps deployed under bridges and tree canopy cover. Four Sussex Autobat acoustic lures used to attract bats to traps	Areas of the disused railway line where lesser and greater horseshoe bats had been recorded by acoustic survey and monitoring.
		June, July and September 2015 and June and August 2016	In 2015 mist nets and harp traps deployed in woodland near tunnel portals to capture breeding females for radio-tracking. In 2016 mist nets and harp traps erected at tunnel portals to capture bats that emerged from roosts within tunnels.	Tunnels on Portbury Freight Line

Annex C: Summary of baseline surveys relevant to the HRA

Ecological feature	Survey type	Dates(s)	Methodology	Study area
	Radio-tracking (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	23rd June 2015 and 14th June 2018	Male and pregnant female greater horseshoe bat fitted with radio transmitters and subsequently tracked using two to three Sika receivers every night until the morning of the 27th June 2015 (with respect to the male) and every night until 17th June 2018 (with respect to the female)	Various
	Hibernation surveys – internal inspection and endoscope surveys (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	10 daytime tunnel inspections between 17th December 2015 and 26th February 2016 and between 29th January and 6th March 2018.	Surveys conducted according to the Bat Conservation Trust's best practice guidelines (Collins ed., 2016).	Tunnels on Portbury Freight Line
		18th and 19th January 23rd February and 6th March 2018		Avon Gorge Woodland – six caves and adits on National Trust, FC and NR land.
	Hibernation surveys – static automated bat detector (see ES Appendix 9.2 Ver. 02, DCO Document Reference 6,25)	17th December 2015 and 26th February 2016.	Surveys conducted according to the Bat Conservation Trust's best practice guidelines (Collins ed., 2016).	The four tunnels on the Portbury Freight Line. One detector per tunnel in Clifton No. 1, Clifton No.2 and Sandstone and two detectors within Pill Tunnel.
Birds	Review of information (see Appendix 9.3a, DCO Document Reference 6,25)	N/A	Consideration of DCO Scheme details on nearby Natura 2000 SPA and Ramsar sites (review of data from AWT, BRERC, Court House Farm Ecological Impact Assessment, Pill Marshes wintering bird survey, WCA Schedule 1 Bird species 2017 Report and specialist advice from Ed Drewitt	Portbury Wharf

Annex C: Summary of baseline surveys relevant to the HRA

Ecological feature	Survey type	Dates(s)	Methodology	Study area
			in respect of peregrines and Chris Sperring in respect of barn owls)	
	Wintering bird survey – transect survey (see Appendix 9.3b, DCO Document Reference 6,25)	Eight visits between October 2014 and January 2015	One high tide and one low-tide survey each month using an adapted WeBS methodology	Pill Marshes and adjacent intertidal section of the River Avon.

Annex D
Screening Matrices

The European sites included within the screening assessment are:

Avon Gorge Woodlands SAC	Wye Valley Woodlands SAC
Severn Estuary SAC	Wye Valley and Forest of Dean Bat Sites SAC
Severn Estuary SPA	Mendip Limestone Grasslands SAC
Severn Estuary Ramsar site	Bath and Bradford-on-Avon Bats SAC
North Somerset and Mendip Bats SAC	Mells Valley SAC
Chew Valley Lake SPA	

Potential Impacts

Potential impacts upon the European site(s)[22] which are considered within the submitted HRA report are provided in the table below.

Designation	Effects described in submission information	Presented in screening matrices as
Avon Gorge Woodlands SAC	• Habitat loss due to vegetation clearance (construction) • Indirect habitat loss as a result of windthrow (operation) • Habitat loss as a result of ongoing vegetation maintenance (operation)	• Habitat loss
	• Habitat fragmentation as a result of habitat loss (construction)	• Habitat fragmentation
	• Habitat degradation as a result of incursions and pollution events (construction) • Habitat degradation due to potential spread of invasive species (construction)	• Habitat degradation

[22] As defined in Planning Inspectorate Advice Note 10 HRA (Version 8, Planning Inspectorate 2017).

Designation	Effects described in submission information	Presented in screening matrices as
	• Habitat degradation due to change in air quality during operation	
Severn Estuary SAC	• Habitat degradation due to run-off of pollution (construction and operation) • Habitat degradation due to changes in air quality (operation).	• Habitat degradation
Severn Estuary SPA	• Construction noise and human disturbance of over-wintering and passage birds (construction) • Operational noise and vibration from passing trains. • Increased accessibility and recreational disturbance	• Disturbance
Severn Estuary Ramsar	• Habitat degradation due to run-off of pollution (construction and operation) • Habitat degradation due to changes in air quality (operation)	• Habitat degradation
	• Construction noise and human disturbance of over-wintering and passage birds (construction) • Operational noise and vibration from passing trains. • Increased accessibility and recreational disturbance	• Disturbance
Chew Valley Lake SPA	• Construction noise and human disturbance of over-wintering and passage birds (construction) • Operational noise and vibration from passing trains. • Increased accessibility and recreational disturbance	• Disturbance
North Somerset and	• Severance of commuting routes (e.g. via direct habitat loss or lighting) (construction and operation).	• Severance

Designation	Effects described in submission information	Presented in screening matrices as
Mendip Bats SAC, Wye Valley Woodlands SAC, Wye Valley and Forest of Dean Bat Sites SAC, Mendip Limestone Grasslands SAC, Bath and Bradford-on-Avon Bats SAC, Mells Valley SAC	• Loss of foraging habitat (construction). • Loss or damage to roosts (construction).	• Habitat loss
	• Disturbance to retained roosts (construction). • Disturbance of bats in tunnels due to increased frequency of train operation (operation).	• Disturbance
	• Killing and injury (during construction via impacts on roosts or during operation via collision risk during operation).	• Killing and/or injury

Evidence for, or against, LSE on the European site(s) and its qualifying feature(s) is detailed within the footnotes to the screening matrices below.

Matrix Key:

✓ = Likely significant effect **cannot** be excluded
✗ = Likely significant effect **can** be excluded

C = construction
O = operation
D = decommissioning

Where effects are not relevant to a particular feature the matrix cell is formatted as follows:

Matrix D1: Avon Gorge Woodlands SAC

Name of European site and designation: Avon Gorge Woodlands SAC												
EU Code: UK0012734												
Distance to DCO Scheme: A 3.8 km section of the scheme lies within the Avon Gorge Woodlands SAC												
European site features:	**European site features:**											
Effect	**Habitat loss**			**Habitat fragmentation**			**Habitat degradation**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
9180 *Tilio-Acerion* forests of slopes, screes and ravines	**✓a**	**✓b**	**×c**	**×d**	**×e**	**×c**	**✓f**	**×g**	**×c**	**×h**	**×h**	**×c**
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*)	**✓i**	**×j**	**×c**	**×d**	**×e**	**×c**	**✓f**	**×k**	**×c**	**×h**	**×h**	**×c**

Evidence supporting conclusions:

a) There will be a 0.73 ha loss of woodland habitat (paragraph 8.3.14, Table 8.3 and Table 11.2 of this HRA and for further details ES Appendix 9.11 AGVMP Ver. 02 Section 3.3 (DCO Document Reference 8.12)), including some individuals of rare whitebeam species (Table 8.5 of this HRA) due to new and replacement fencing, works to bridge structures, laying of new track, replacement of old track and ballast, installation of signalling and repeater masts and other associated structures (Table 5.2 of this HRA). Individual trees, including rare species of whitebeam, will need to be removed for safety reasons, particularly those growing over tunnel portals and on cliff faces above the track.

b) During operation of the DCO Scheme, woodland habitat may be more susceptible to windthrow due to the removal of edge trees (Table 7.1 of HRA; section 3.1.1 of ES Appendix 9.11 AGVMP Ver. 02 Section 3.1 (DCO Document Reference 8.12); and paragraph 9.6.41 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO

Document Reference 6.12)). However, standard NR vegetation maintenance will not extend beyond the extent of vegetation clearance undertaken during construction (paragraph 5.3.4 of HRA) and therefore no further habitat loss beyond that in the construction phase

c) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (ES Chapter 4 Description of the Proposed Works, section 4.10 (DCO Document Reference 6.7)).

d) No habitat fragmentation is anticipated as the route of the line already exists and vegetation removal will be removing vegetation away from the line and individual trees on rock faces (Table 7.1 of this HRA).

e) Ongoing Network Rail operations for the maintenance of the line, would be along the route of the line and would not result in any fragmentation (Table 7.1 of this HRA).

f) There is the potential for degradation of qualifying habitat during construction as a consequence of inadvertent incursions, pollution incidents (e.g. spillages of oils and other pollutants and ballast-cleaning water) and spread of invasive species (Table 7.1 and paragraph 8.3.3 of this HRA).

g) There are no changes in vegetation composition or degradation predicted in woodland habitats as a result of air pollution during operation. Changes in NOx concentrations are negligible (paragraph 6.2.20 of this HRA; ES Chapter 7 Air Quality and Greenhouse Gases, para. 7.6.31-32 (DCO Document Reference 6.10)). The increase in N deposition is very small and the critical load for woodland vegetation is already exceeded (paragraph 6.2.21 of this HRA; ES Chapter 7 Table 7.10 (DCO Document Reference 6.10)).

h) No other projects or plans which could impact upon the qualifying habitats have been identified and thus no in-combination LSE are possible (section 7.2 of this HRA and ES Chapter 18 (DCO Document Reference 6.21)).

i) There will be a loss of 0.06 ha of qualifying grassland habitat as a result of construction (paragraph 8.3.14, Table 8.3 and Table 11.2 of this HRA; ES Appendix 9.11 AGVMP Ver. 02 Section 3.3 (DCO Document Reference 8.12)).

j) During operation of the DCO Scheme, there may be some vegetation management required by NR but this is likely to be restricted to woody species and thus affect woodland habitat and not qualifying grassland habitat (Table 7.1 of this HRA). Standard NR vegetation maintenance will not extend beyond the extent of vegetation clearance undertaken during construction (paragraph 5.3.4 of this HRA).

k) There are no changes in vegetation composition or degradation predicted in grassland habitats as a result of air pollution during operation. Changes in NOx concentrations are negligible (para.6.2.20 of this HRA; ES Chapter 7 Air Quality and Greenhouse Gases para. 7.6.31-32 (DCO Document Reference 6.10)). The increase in N deposition is small and remains within the critical load range for grassland vegetation (paragraph. 6.2.21 of this HRA ES Chapter 7 Air Quality and Greenhouse Gases Table 7.10 (DCO Document Reference 6.10)).

Matrix D2: Severn Estuary SAC

Name of European site and designation: Severn Estuary SAC												
EU Code: UK0013030												
Distance to DCO Scheme: Approximately 80m to north of the DCO Scheme at the closest point during operation and c.30m to a diverted access point during construction.												
European site features	**Likely effects of NSIP**											
Effect	**Habitat degradation**			**In combination effects**								
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**						
1130 Estuaries	**×a**	**×a**	**×b**	**×c**	**×c**	**×b**						
1140 Mudflats and sandflats not covered by seawater at low tide	**×a**	**×a**	**×b**	**×c**	**×c**	**×b**						
1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	**×d**	**×d**	**×b**	**×c**	**×c**	**×b**						
1110 Sandbanks which are slightly covered by sea water all the time	**×a**	**×a**	**×b**	**×c**	**×c**	**×b**						
1170 Reefs	**×a**	**×a**	**×b**	**×c**	**×c**	**×b**						
1095 Sea lamprey *Petromyzon marinus*	**×e**	**×e**	**×b**	**×c**	**×c**	**×b**						
1099 River lamprey *Lampetra fluviatilis*	**×e**	**×e**	**×b**	**×c**	**×c**	**×b**						
1103 Twaite shad *Alosa fallax*	**×e**	**×e**	×b	**×c**	**×c**	**×b**						

Evidence supporting conclusions:

a) No effects anticipated for qualifying habitats which are estuarine or covered by seawater part or all of the time, due to distance and lack of hydrological linkages. Even if run-off could reach the estuary, any change would be rapidly diluted due to the size of the estuary (paragraph 7.3.2 of this HRA; Figure 1, Annex A of this HRA; ES Chapter 17 (DCO Document 6.20), Appendix 17.3 in ES Volume 4 (DCO Document Reference 6.25) and Figure 17.1 in ES Volume 3 Book of Figures (DCO Document Reference 6.24)).

b) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (ES Chapter 4 section 4.10 (DCO Document Reference 6.7)).

c) No other projects or plans which could impact upon the qualifying habitats have been identified and thus no in-combination LSE are possible (section 7.2 of this HRA and ES Chapter 18 (DCO Document Reference 6.21)).

d) There is no potential for pollution run-off to impact on SAC qualifying Atlantic salt meadows in the Pill area as there is no hydrological connectivity between the DCO Scheme and the SAC habitat (paragraph 7.3.2 of this HRA; Chapter 17 of the ES (DCO Document Reference 6.20); Appendix 17.3 in ES Volume 4 (DCO Document Reference 6.25); and Figure 17.1 in ES Volume 3 Book of Figures (DCO Document Reference 6.24)). The air quality changes due to the DCO Scheme are minimal and existing nitrogen deposition is well below the critical load for salt meadow pioneer, low-mid, mid-upper saltmarsh) habitat (Table 7.10 in ES Chapter 7 (DCO Document Reference 6.10)).

e) The subtidal habitats of fish are further than 250 m from the DCO Scheme (Figure 1, Annex A of this HRA). There is no potential for run-off of pollutants to reach the site due to a lack of hydrological linkages (paragraph 7.3.2 of this HRA; ES Chapter 17 (DCO Document Reference 6.20) and Figure 17.1 in ES Volume 3 Book of Figures (DCO Document Reference 6.24)).

Matrix D3: Severn Estuary SPA

Name of European site and designation: Severn Estuary SPA												
EU Code: UK9015022												
Distance to DCO Scheme: Approximately 80 m to north of the site at the closest point.												
European site features	**Likely Effects of DCO Scheme**											
Effect	**Disturbance**			**In combination effects**								
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
Cygnus columbianus bewickii; Bewick's swan (Non-breeding)	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						
Tadorna tadorna; Common shelduck (Non-breeding)	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						
Anas strepera; Gadwall (Non-breeding)	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						
Calidris alpina alpina; Dunlin (Non-breeding)	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						
Tringa totanus; Common redshank (Non-breeding)	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						
Anser albifrons albifrons; Greater white-fronted goose (Non-breeding)	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						
Waterfowl assemblage	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						
Passage birds	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						

Evidence supporting conclusions:

a) Pill Marshes and the adjacent intertidal section of the River Severn are currently subject to a range of noise and visual disturbance, including the freight rail traffic, M5 traffic and dog walkers. The noise model indicates an existing noise level at the SPA at Pill of 59 dB $L_{Aeq,16h}$ (Table 7.103 of ES Appendix 13.7 (DCO Document Reference 6.25)) . Construction activities will generate additional noise (Table 6.4 of this HRA) but given the low numbers of birds and existing noise levels and visual disturbance, there is not predicted to be LSE on SPA birds. At Portbury Wharf Nature Reserve, the SPA qualifying bird species shelduck and gadwall were recorded using the wetland areas in the northern part of the reserve which is approximately 650 m north of the DCO Scheme. The existing noise level at the most representative survey location for the pools/lagoons is 46 dB $L_{Aeq,16h}$ (Table 7.103 of ES Appendix 13.7 (DCO Document Reference 6.25)). The construction activities most likely to cause disturbance of birds at the pools is considered in paragraph 6.3.13 of this HRA. The predicted noise at the pools/lagoons where SPA/Ramsar birds are most likely to occur considering both the existing and predicted noise levels is 49 dB $L_{Aeq,12h}$ from Ballasting/Tamping/Lining works and 49 dB $L_{Aeq,12h}$ from percussive (hammer) piling works at Trinity Primary School Bridge (Table 7.103 of ES Appendix 13.7 (DCO Document Reference 6.25)). These are lower than levels found to cause disturbance of wetland birds (paragraph 5.3.15 of this HRA) and therefore no LSE.

b) No change in noise levels above 59 $L_{Aeq,16h}$ are predicted except when trains are passing. The maximum levels due to passing trains are predicted to be 74 dB at 60 m and 71 dB at 120 m (paragraph 6.3.12 of this HRA and paragraph 3.1.4 in ES Appendix 13.3 (DCO Document Reference 6.25)).The SPA boundary is 80 m from the running rail at Pill. Given the SPA is currently exposed to noise from the M5 which dominates the noise climate in this area, the addition of the passenger trains is considered unlikely to increase the level of disturbance in the SPA. (paragraph 6.3.12 of this HRA and paragraph 13.6.85 of ES Chapter 13 Noise and Vibration (DCO Document Reference 6.16)). The pools and lagoons of Portbury Wharf Reserve are 650m from the operational line and operational noise due to the passage of trains is expected to be below 30 dB $L_{Aeq,16h}$, resulting in no increase in noise at this location (paragraph 6.3.15 of this HRA and paragraph 13.6.78 of ES Chapter 13 Noise and Vibration (DCO Document Reference 6.16)). During operation of the Sheepway permanent maintenance compound, the highest noise level is predicted to be 63 dB $L_{Aeq,16h}$, due to vehicle movements, at 50m from the source of the noise (Table 13.20 in ES Chapter 13 (DCO Document Reference 6.16)). Given that the pools and lagoons are 650m distant, no LSE is predicted.

The DCO Scheme is unlikely to result in increased recreational disturbance to the Severn Estuary SPA. Pill Marshes are already subject to human disturbance due to dog-walkers and extensive residential and commercial

areas nearby (ES Appendix 9.3b (DCO Document Reference 6.25)). Pill Marshes is used by so few SPA-qualifying birds (Table 6.1 of this HRA), that no LSE due to operational noise is predicted. Portbury Wharf Nature Reserve is not sufficiently close to any station stops to encourage additional visitors.

c) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (ES Chapter 4 Description of the Works, section 4.10 (DCO Document Reference 6.7)).

d) The possibility of in-combination LSE with Hinkley Connection Project was investigated, but no LSE identified (Table 7.2 of this HRA).

Matrix D4: Severn Estuary Ramsar

Name of European site and designation: Severn Estuary Ramsar												
EU Code: UK11081												
Distance to DCO Scheme: Approximately 80 m to north of the site at the closest point.												
European site features	**Likely Effects of DCO Scheme**											
Effect	**Degradation (of habitats)**			**Disturbance (of species)**			**In-combination**					
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
Criterion 1: Immense tidal range	**×a,b**	**×a,b**	**×c**				**×d**	**×d**	**×c**			
Criterion 3: Estuarine communities	**×a, b**	**×a, b**	**×c**				**×d**	**×d**	**×c**			
Criterion 4: Migratory fish and birds	**×e**	**×e**	**×c**				**×d**	**×d**	**×c**			
Criterion 8: Fish communities	**×e**	**×e**	**×c**				**×d**	**×d**	**×c**			
Ramsar criterion 5: Assemblage of international importance				**×f**	**×g**	**×c**	**×d**	**×d**	**×c**			
Ramsar criterion 6: species / populations occurring at levels of international importance: Tundra (Bewick's) swan, *Cygnus columbianus bewickii,* Greater white-fronted goose *Anser albifrons,* Common shelduck, *Tadorna tadorna* Gadwall *Anas strepera,* Dunlin *Calidris alpine,* Common redshank *Tringa tetanus.* Additionally, potential future designations under criterion 6 are: Lesser black-backed gull *Larus fuscus graellsii* (breeding)				**×f**	**×g**	**×c**	**×d**	**×d**	**×c**			

Name of European site and designation: Severn Estuary Ramsar													
EU Code: UK11081													
Distance to DCO Scheme: Approximately 80 m to north of the site at the closest point.													
European site features	**Likely Effects of DCO Scheme**												
Effect	**Degradation (of habitats)**			**Disturbance (of species)**			**In-combination**						
Ringed plover *Charadrius hiaticula* (passage) Eurasian teal *Anas crecca* (winter) Northern pintail *Anas acuta* (winter)													

Evidence supporting conclusions:

a) There is no potential for pollution run-off to impact on estuarine habitat such as salt meadow in the Pill area as there is no hydrological connectivity between the DCO Scheme and the Ramsar habitat (see para. 7.3.2 of this HRA; Figure 1, Annex A of this HRA; Chapter 17 Water Resource, Drainage and Flood Risk of the ES (DCO Document Reference 6.20); Appendix 17.3 in ES Volume 4 (DCO Document Reference 6.25); and Figure 17.1 in ES Volume 3 Book of Figures (DCO Document Reference 6.24)). The air quality changes due to the DCO Scheme are minimal and existing nitrogen deposition is well below the critical load for salt meadow habitat (Table 7.10 ES Chapter 7 Air Quality and Greenhouse Gases (DCO Document Reference 6.10)).

b) No effects anticipated for qualifying habitats which are estuarine or covered by seawater part or all of the time, due to distance and lack of hydrological linkages. Even if run-off could reach the estuary, any change would be rapidly diluted due to the size of the estuary (para. 7.3.2 of this HRA; Figure 1, Annex A of this HRA; ES Chapter 17 (DCO Document Reference 6.20); Appendix 17.3 in ES Volume 4 (DCO Document Reference 6.25); and Figure 17.1 in ES Volume 3 Book of Figures (DCO Document Reference 6.24)).

c) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (see ES Chapter 4 Description of the Proposed Works section 4.10 (DCO Document Reference 6.7)).

d) The possibility of in-combination LSE was investigated, but no LSE identified (Table 7.2 in this report).

e) The subtidal habitats of fish are further than 250 m from the DCO Scheme (see Figure 1, Annex A in this HRA). There is no potential for run-off of pollutants to reach the site due to a lack of hydrological linkages (see para. 7.3.2 in this HRA).

f) Pill Marshes and the adjacent intertidal section of the River Severn are currently subject to a range of noise and visual disturbance, including the freight rail traffic, M5 traffic and dog walkers. The noise model indicates an existing noise level at the Ramsar boundary at Pill 59 dB LAeq,16h (Table 7.103 of ES Appendix 13.7 (DCO Document Reference 6.25)). Construction activities will generate additional noise (Table 6.4 of this HRA), but given the low numbers of birds and existing noise levels and visual disturbance, there is not predicted to be a LSE on Ramsar birds. At Portbury Wharf Nature Reserve, the Ramsar species shelduck, gadwall, teal and pintail were recorded using the wetland areas in the northern part of the reserve which is approximately 650 m north of the DCO Scheme. The existing noise level at the most representative survey location for the pools/lagoons is 46 dB LAeq,16h (Table 7.103 of ES Appendix 13.7 (DCO Document Reference 6.25)). The construction activities most likely to cause disturbance of birds at the pools is considered in paragraph 6.3.13 of this HRA. The predicted noise at the pools/lagoons where SPA/Ramsar birds are most likely to occur considering both the existing and predicted noise levels is 49 dB LAeq,12h from Ballasting/Tamping/Lining works and 49 dB LAeq,12h from percussive (hammer) piling works at Trinity Primary School Bridge (Table 7.103 of ES Appendix 13.7 (DCO Document Reference 6.25)). These are lower than levels found to cause disturbance of wetland birds (paragraph 5.3.15 of this HRA) and therefore no LSE. piling works at Trinity Primary School Bridge (Table 7.103 of ES Appendix 13.7 (DCO Document Reference 6.25)). These are lower than levels found to cause disturbance of wetland birds (paragraph 5.3.15 of this HRA) and therefore no LSE.

g) No change in noise levels above 59 LAeq,16h are predicted except when trains are passing. The maximum levels due to passing trains are predicted to be 74 dB at 60 m and 71 dB at 120 m (paragraph 6.3.12 of this HRA and paragraph 3.1.4 in ES Appendix 13.3 (DCO Document Reference 6.25)). The Ramsar boundary is 80 m from the running rail at Pill. Given the Ramsar is currently exposed to noise from the M5 which dominates the noise climate in this area, the addition of the passenger trains is considered unlikely to increase the level of disturbance in the Ramsar site at Pill Marshes (paragraph 6.3.12 of this HRA and paragraph 13.6.85 of ES Chapter 13 Noise and Vibration (DCO Document Reference 6.16)). The pools and lagoons of Portbury Wharf Reserve are 650m from the operational line and operational noise due to the passage of trains is expected to be below 30 dB $L_{Aeq,16h}$, resulting in no increase in noise at this location (paragraph 6.3.15 of this HRA and paragraph 13.6.78 of ES Chapter 13 Noise and Vibration (DCO Document Reference 6.16)). During operation of the Sheepway permanent maintenance compound, the highest noise level is predicted to be 63 dB $L_{Aeq,16h}$, due

to vehicle movements, at 50m from the source of the noise (Table 13.20 in ES Chapter 13 (DCO Document Reference 6.16)). Given that the pools and lagoons are 650m distant, no LSE is predicted.

The DCO Scheme is unlikely to result in increased recreational disturbance to the Severn Estuary Ramsar. Pill Marshes are already subject to human disturbance due to dog-walkers and extensive residential and commercial areas nearby (ES Appendix 9.3b DCO Document Reference 6.25)). Pill Marshes is used by so few SPA-qualifying birds (Table 6.1 of this HRA), that no LSE due to operational noise is predicted. Portbury Wharf Nature Reserve is not sufficiently close to any station stops to encourage additional visitors (see para. 6.3.11 of this HRA).

Matrix D5: North Somerset and Mendip Bats SAC

Name of European site and designation: North Somerset and Mendip Bats SAC															
EU Code: UK0030052															
Distance to DCO Scheme: The site is located 9 km away from the European Site at its closest point.															
European site features	**Likely effects of DCO Scheme**														
Effect	**Habitat loss**			**Severance**			**Killing and/or injury**			**Disturbance**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia*															
9180 *Tilio-Acerion* forests of slopes, screes and ravines															
8310 Caves not open to the public															
1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	**×a, b**	**×c**	**×d**	**✓e**	**✓e**	**×d**	**×f**	**×g**	**×d**	**×h**	**×i**	**×d**	**✓j**	**✓j**	**×d**
1303 Lesser horseshoe bat *Rhinolophus hipposideros*	**×a, b**	**×c**	**×d**	**✓e**	**✓e**	**×d**	**×f**	**×g**	**×d**	**×h**	**×i**	**×d**	**✓j**	**✓j**	**×d**

Evidence supporting conclusions:

Greater and lesser horseshoe bats have been demonstrated to use habitats along the route of the DCO Scheme. Parts of the DCO Scheme are within the outer extent of Zones B & C of the 'North Somerset Bat Consultation Zone' and two greater horseshoe bats have been radio tracked back to the North Somerset and Mendip Bats SAC (section 6.4 of this HRA).

a) Vegetation removal is limited and restricted largely to areas of vegetation line side with negligible loss on a landscape scale therefore there are not considered to be LSE as a result of loss of foraging habitat (Table 7.1 of this HRA; ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12)).

b) Roosts of greater and lesser horseshoe bat have been identified along the route of the DCO Scheme (section 6.4 of this HRA) some of which will be lost as a result of the proposed works (Section 9.6 of ES Chapter 9 Ecology and Biodiversity Ver. 02 (DCO Document Reference 6.12)). However, the roosts support very small numbers of bats which may not be associated with the SAC. Any loss of roosts which do support SAC bats would affect a negligible proportion of the SAC population and therefore no LSE.

c) Vegetation clearance during operation will not extend further than the area cleared for construction (paragraph 5.3.4 of this HRA). Maintenance works during operation will require limited vegetation removal and are unlikely to result in the loss of any roosting structures (paragraph 3.2.68 of this HRA and ES Chapter 4 Description of the Proposed Works, section 4.5 (DCO Document Reference 6.7)).

d) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (see ES Chapter 4 Description of the Proposed Works, section 4.10 (DCO Document Reference 6.7)).

e) Bat activity surveys along the disused railway part of the DCO Scheme show that it is an important corridor for bats (see para. 6.4.2 of this HRA and ES Appendix 9.2 Ver. 02 (DCO Document Reference 6.25)). Vegetation removal and lighting during construction could sever commuting routes of bats which form part of the SAC population. Vegetation clearance to facilitate the construction and operation of the DCO Scheme will result in the reduction and removal of a linear corridor of trees and scrub along the currently disused line. The change to the physical structure of the corridor could disrupt navigational features in several areas that bats rely on for movement through the landscape e.g. at Royal Portbury Dock.

f) Roosts of greater and lesser horseshoe bat have been identified along the route of the DCO Scheme (section 6.4 of this HRA and ES Appendix 9.2 Ver. 02 (DCO Document Reference 6.25)), some of which will be lost/disturbed, with a risk of killing or injury as a result of the proposed works. Work will be carried out under licence. Any loss of roosts which do support SAC bats would affect a negligible proportion of the SAC population and therefore no LSE.

g) Collision risk is considered to be low as horseshoe bats are likely to stick close to vegetation off the line of collision risk and patterns of bat activity are dispersed (Table 7.1 of this HRA).

h) Roosts of greater and lesser horseshoe bats identified along the DCO Scheme (see section 6.4 of this HRA) could be disturbed by construction works. There may be minor disruption to the lesser and greater horseshoe roost in the derelict store near Sheepway during the construction period when vegetation is cleared and disturbance of the bats roosting in the arches at Pill Station. However, these roosts support only 1 to 4

individuals of lesser and greater horseshoes and even if these roosts are lost or abandoned, no LSE is predicted (Table 7.1 of this HRA).

i) There is potential for disturbance of the bats roosting in the arches at Pill Station during operation. Although the arches are to be retained, the platforms will be lit during operation and it is possible that bats will abandon this as a roost site. However, these roosts support only 1 to 4 individuals of lesser and greater horseshoes and even if these roosts are lost or abandoned, no LSE is predicted (Table 7.1 of this HRA). Any disturbance of roosts which do support SAC bats would affect a negligible proportion of the SAC population and therefore no LSE. The potential disturbance / displacement of lesser horseshoe bats from roosts within Clifton Bridge No. 2 Tunnel as a result of increased train frequency is not considered likely to have significant effects. Bats already experience disturbance from freight trains, only a small number of bats are likely to be affected and there is abundance of alternative natural roost features (such as caves) in the Avon Gorge Woodlands.

j) There is a potential for in-combination effects with the Royal Portbury Docks development due to vegetation removal and impacts of lighting on severance of navigational routes (Table 7.2 of this HRA).

Matrix D6: Chew Valley Lake SPA

Name of European site and designation: Chew Valley Lake SPA												
EU Code: UK9010041												
Distance to DCO Scheme: The site is located 9 km away from the European Site at its closest point.												
European site features	**Likely Effects of DCO Scheme**											
Effect	**Disturbance**			**In combination effects**								
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
Shoveler *Anas clypeata (*winter populations*)*	**×a**	**×b**	**×c**	**×d**	**×d**	**×d**						

Evidence supporting conclusions:

a) Shoveler was present in the northern part of Portbury Wharf Nature Reserve, which is approximately 650 m north of the DCO Scheme. The predicted noise level at the pools/lagoons are lower than levels found to cause disturbance of wetland birds ((Table 7.103 of ES Appendix 13.7 (DCO Document Reference 6.25)), paragraph 5.3.15 of this HRA) and therefore no LSE. Furthermore, the shoveler at Portbury Wharf are unlikely to be connected to the Chew Valley Lake SPA population due to distance (9 km).

b) As the pools in the reserve are approximately 650 m from the DCO Scheme, no changes in operational noise due to passing trains are predicted at this distance (paragraph. 6.3.15 of this HRA and paragraph 13.6.78 of ES Chapter 13 Noise and Vibration (DCO Document Reference 6.16)). The operational noise level at the Sheepway permanent maintenance compound at Portbury Wharf Nature Reserve is predicted to change from the existing level of 51 $L_{Aeq,16h}$ dB(A) , to 54 $L_{Aeq,16h}$ dB(A). This small change is not predicted to cause disturbance of the birds using the pools and lagoons. Furthermore, the shoveler at Portbury Wharf are unlikely to be connected to the Chew Valley Lake SPA population due to distance (9 km). Portbury Wharf Nature Reserve is not sufficiently close to any station stops to encourage additional visitors that may cause disturbance above current levels (Table 7.1 of this HRA).

c) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (see ES Chapter 4 Description of the Proposed Works, section 4.10 (DCO Document Reference 6.7)).

d) Due to distance from the DCO Scheme, no other projects or plans which could impact upon shoveler have been identified and thus no in-combination LSE are possible.

Matrix D7: Wye Valley Woodlands SAC

Name of European site and designation: Wye Valley Woodlands SAC															
EU Code: UK0012727															
Distance to DCO Scheme: The site is located 18.5 km away from the European Site at its closest point.															
European site features	**Likely effects of DCO Scheme**														
Effect	**Habitat loss**			**Severance**			**Killing and/or injury**			**Disturbance**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
9130 *Asperulo-Fagetum* beech forests															
9180 *Tilio-Acerion* forests of slopes, screes and ravines															
91J0 *Taxus baccata* woods of the British Isles															
1303 Lesser horseshoe bat *Rhinolophus hipposideros*	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×c**	**×c**	**×c**

Evidence supporting conclusions:

a) The DCO Scheme site falls c.18.5 km from the SAC. Research indicates lesser horseshoe bats forage and hibernate in closer proximity to nursery roost sites. Therefore direct impacts on roosts or daily foraging/commuting habitat of lesser horseshoe bats from this SAC are therefore not anticipated (Table 7.1 of this HRA).

b) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (see ES Chapter 4 Description of the Proposed Works, section 4.10 (DCO Document Reference 6.7)).

Due to distance from the DCO Scheme, no other projects or plans which could impact this SAC have been identified and thus no in-combination LSE are possible.

Matrix D8: Wye Valley and Forest of Dean Bat Sites SAC

Name of European site and designation: Wye Valley and Forest of Dean Bat Sitess SAC															
EU Code: UK0014794															
Distance to DCO Scheme: The site is located 19 km away from the European Site at its closest point.															
European site features	**Likely effects of DCO Scheme**														
Effect	**Habitat loss**			**Severance**			**Killing and/or injury**			**Disturbance**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
1303 Lesser horseshoe bat *Rhinolophus hipposideros*	**×a**	**×a**	**×c**	**×a**	**×a**	**×c**	**×a**	**×a**	**×c**	**×a**	**×a**	**×c**	**×d**	**×d**	**×d**
1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	**×b**	**×b**	**×c**	**×b**	**×b**	**×c**	**×b**	**×b**	**×c**	**×b**	**×b**	**×c**	**×d**	**×d**	**×d**

Evidence supporting conclusions:

a) The DCO Scheme site falls c.19 km from the SAC. Research indicates lesser horseshoe bats forage and hibernate in closer proximity to nursery roost sites. Therefore direct impacts on roosts or daily foraging/commuting habitat of lesser horseshoe bats from this SAC are therefore not anticipated (Table 7.1 of this HRA).

b) The SAC is located on the opposite side of the Severn Estuary and outside of the foraging range of the DCO Scheme and direct impacts on roosts or daily foraging/commuting habitat of greater horseshoe bats from this SAC are therefore not anticipated (Table 7.1 of this HRA).

c) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (see ES Chapter 4 Description of the Proposed Works, section 4.10 (DCO Document Reference 6.7)).

d) Due to distance from the DCO Scheme, no other projects or plans which could impact this SAC have been identified and thus no in-combination LSE are possible.

Matrix D9: Mendip Limestone Grasslands SAC

Name of European site and designation: Mendip Limestone Grasslands SAC															
EU Code: UK0030203															
Distance to DCO Scheme: The site is located 21 km away from the European Site at its closest point.															
European site features	**Likely effects of DCO Scheme**														
Effect	**Habitat loss**			**Severance**			**Killing and/or injury**			**Disturbance**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites)															
4030 European dry heaths															
8310 Caves not open to the public															
9180 Tilio-Acerion forests of slopes, screes and ravines * Priority feature															
1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×c**	**×c**	**×c**

Evidence supporting conclusions:

a) The DCO Scheme is located 21 km away from the European Site at its closest point. The SAC is designated for its hibernation roosts of greater horseshoe bats which when active in winter have a home range of c. 2km (pers. comms. via e-mail 27.11.18 Ecologist, Somerset County Council). The DCO Scheme is not within a Consultation Zone for the Mendip Limestone Grasslands SAC and no LSE is predicted (Table 7.1 of this HRA).

b) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (see ES Chapter 4 Description of the Proposed Works, section 4.10 (DCO Document Reference 6.7)).

c) Due to distance from the DCO Scheme, no other projects or plans which could impact this SAC have been identified and thus no in-combination LSE are possible.

Matrix D10: Bath and Bradford-on-Avon Bats SAC

Name of European site and designation: Bath and Bradford-on-Avon Bats SAC															
EU Code: UK0012584															
Distance to DCO Scheme: The site is located 22 km away from the European Site at its closest point.															
European site features	**Likely effects of DCO Scheme**														
Effect	**Habitat loss**			**Severance**			**Killing and/or injury**			**Disturbance**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
1303 Lesser horseshoe bat *Rhinolophus hipposideros*	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**
1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**
1323 Bechstein`s bat *Myotis bechsteinii*															

Evidence supporting conclusions:

a) Wiltshire Council (2015) provide advice on ‘Core Areas’ within which LSE bats should be considered for the Bath and Bradford-on-Avon Bats SAC. These core areas extend to 4 km for greater horseshoe bat and 2 km for lesser horseshoe bat. The DCO Scheme is c.22km from the SAC and therefore no LSE (Table 7.1 of this HRA).

b) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (see ES Chapter 4 Description of the Proposed Works, section 4.10 (DCO Document Reference 6.7)).

c) Due to distance from the DCO Scheme, no other projects or plans which could impact this SAC have been identified and thus no in-combination LSE are possible.

Matrix D11: Mells Valley SAC

Name of European site and designation: Mells Valley SAC															
EU Code: UK0012658															
Distance to DCO Scheme: The site is located 24 km away from the European Site at its closest point.															
European site features	**Likely effects of DCO Scheme**														
Effect	**Habitat loss**			**Severance**			**Killing and/or injury**			**Disturbance**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites)															
8310 Caves not open to the public															
1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×a**	**×a**	**×b**	**×c**	**×c**	**×c**

Evidence supporting conclusions:

a) The DCO Scheme site falls c.24 km from the SAC and is situated well outside the Bat Consultation Zones identified for the SAC, which extend up to 8 km for maternity roosts and 2.44 km for ‘other’ roosts (Mendip District Council, 2018). No LSE (Table 7.1 of this HRA).

b) There are no intentions to de-commission the DCO Scheme in the foreseeable future and therefore impacts of decommissioning have not been assessed (see ES Chapter 4 Description of the Proposed Works, section 4.10 (DCO Document Reference 6.7)).

c) Due to distance from the DCO Scheme, no other projects or plans which could impact this SAC have been identified and thus no in-combination LSE are possible.

Annex E
HRA Integrity Matrices

LSE have been identified for the following sites:

- Avon Gorge Woodlands SAC
- Severn Estuary SAC/Ramsar (Atlantic salt meadow habitat only)
- North Somerset and Mendip Bats SAC

These sites have been subject to further assessment in order to establish if the NSIP could have an adverse effect on their integrity. Evidence for the conclusions reached on integrity is detailed within the footnotes to the matrices below.

HRA Integrity Matrix Key

✓ **=** Adverse effect on integrity **cannot** be excluded

✕ **=** Adverse effect on integrity **can** be excluded

C = construction

O = operation

D = decommissioning

Where effects are not relevant to a particular feature the matrix cell is as follows:



Matrix E1: HRA Integrity Matrix: Avon Gorge Woodlands SAC

Name of European site and designation: Avon Gorge Woodlands SAC												
EU Code: UK0012734												
Distance to DCO Scheme: A 3.8 km section of the scheme lies within the Avon Gorge Woodlands SAC												
European site features	**Adverse effect on integrity**											
Effect	**Habitat loss**			**Habitat fragmentation**			**Habitat degradation**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
9180 *Tilio-Acerion* forests of slopes, screes and ravines	**✓a**	**×b**					**×c**					
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*)	**✓a**						**×c**					

Evidence supporting conclusions:

a) The DCO Scheme results in loss of Priority SAC woodland habitat (0.73 ha) and SAC grassland (0.06 ha), and up to 27 individual rare whitebeams, which are a component of the SAC woodland (Tables 8.3 and 8.4 of this HRA). This includes the loss of 0.40 ha of semi-natural ancient woodland which is considered to be an 'irreplaceable' habitat' and of 29% of the known global population of Avon whitebeam. Therefore, it cannot be concluded that no reasonable scientific doubt remains that the DCO Scheme will not adversely affect the integrity of the Avon Gorge Woodlands SAC as a result of habitat loss (paragraph 8.5.11 of this HRA).

b) Network Rail operations shall be planned such that the risk of windthrow is not increased following felling and no further habitat loss is anticipated (paragraph 8.5.9 of this HRA).

c) During construction, those impacts relating to habitat degradation via invasive species transfer and incursions in qualifying habitats would be mitigated for via good practice including site briefings, the presence of an ECoW, demarcation of sensitive species and careful planning of access and use of machinery to avoid spread (paragraphs 8.4.8-8.4.21 of this HRA), in compliance with the Master CEMP Ver. 02 (section 6, ES Appendix 4.2 (DCO Document Reference 8.14)).

Matrix E2: HRA Integrity Matrix: North Somerset and Mendip Bats SAC

Name of European site and designation: North Somerset and Mendip Bats SAC															
EU Code: UK0030052															
Distance to DCO Scheme: The site is located 9 km away from the European Site at its closest point.															
European site features	**Likely effects of DCO Scheme**														
Effect	**Habitat loss**			**Severance**			**Killing and/or injury**			**Disturbance**			**In combination effects**		
Stage of Development	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**	**C**	**O**	**D**
1304 Greater horseshoe bat *Rhinolophus ferrumequinum*				**×a**	**×a**								**×b**	**×b**	
1303 Lesser horseshoe bat *Rhinolophus hipposideros*				**×a**	**×a**								**×b**	**×b**	

Evidence supporting conclusions:

a) The DCO Scheme will retain and re-plant vegetation along the Portishead to Pill line to help maintain the character of the rail corridor. The railway embankment and topography of the land within the rail corridor will provide some sheltered flight areas for lesser and greater horseshoe bats (paragraphs 8.4.51-8.4.59 of this HRA and Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10)). Low scrub vegetation growth will provide adequate cover for sheltered bat flight lines within the Portbury Wharf area and through farmland, and taller vegetation for screening would be planted at Royal Portbury Docks to obscure lighting and activities in the port which is expanding onto the east side.

b) Taking into the account the proposed mitigation, no adverse effects on SAC bats are predicted for the DCO Scheme and potential in-combination effects, highlighted for the Court House Farm development at Royal Portbury Docks (Table 7.2 of this HRA), are not considered likely (paragraph 8.5.19 of this HRA).

