MetroWest

Portishead Branch Line (MetroWest Phase 1)

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Applicant: North Somerset District Council
6.12, Environmental Statement, Volume 2, Chapter 9 Ecology and Biodiversity
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Notice

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01	11/11/19	Application Issue
02	20/9/20	Update on GCNs, bats, and whitebeam plantings following consultation with Natural England and new surveys
03	15/03/21	Updates, particularly on GCN and toads

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CHAPTER 9

Ecology and Biodiversity

9.1 Introduction

9.1.1 The Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme (“the DCO Scheme”) has the potential to give rise to likely significant effects on ecology and biodiversity. This chapter:

- describes the relevant legal and policy framework which informs the undertaking of the assessment;
- describes the methodology used for the identification and assessment of likely significant ecology and biodiversity effects in this Environmental Statement ("ES");
- describes the ecology and biodiversity baseline having regard to existing information;
- describes the measures that have been adopted as part of the DCO Scheme;
- identifies and assesses the likely significant effects that could result from the DCO Scheme during the construction and operation phases;
- considers mitigation of likely significant effects and assesses those residual effects that will result;
- considers the cumulative effects of other developments with the DCO Scheme on habitats, flora and fauna;
- identifies the limitations encountered in compiling the biodiversity chapter of the ES; and
- provides a summary of the residual effects for the mitigated DCO Scheme.

9.1.2 This chapter focuses on the important ecological features which comprise: sites which are designated (statutory and non-statutory) for their nature conservation importance at the European, national and local level; sensitive and valued habitats (e.g. wetland and mature trees); species which are protected through European or national legislation; and habitats and species which are valued through either policy, biodiversity action plans ("BAP") or as priorities for conservation. Some ecological features may still be important but not covered by the stated criteria because they provide an important ecological function, for example hedgerows and linear habitats which provide potential corridors for movement for species. These ecological features have potential to experience impacts which are significant at the European, national, regional or local level.

9.1.3 This chapter should be read in conjunction with Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7) and Chapter 6 Planning Framework (DCO Document Reference 6.9). This chapter is also supported by ecological and lighting reports in ES Appendices 9.1 to 9.18 (DCO Document Reference 6.25), the Report to Inform Habitat Regulations

Assessment (DCO Document Reference 5.5), and the Avon Gorge Vegetation Management Plan (DCO Document Reference 8.12).

9.1.4 This chapter draws on outputs of other topics of the environmental impact assessment ("EIA"), notably Chapter 7 Air Quality and Greenhouse Gases (DCO Document Reference 6.10), Chapter 13 Noise and Vibration (DCO Document Reference 6.16), and Chapter 17 Water Resources, Drainage and Flood Risk (DCO Document Reference 6.20), to determine the nature and extent of possible impacts on ecological features. There is also cross-referencing to the landscaping proposals, particularly in relation to mitigation, which is presented in Chapter 11 Landscape and Visual Impact Assessment (DCO Document Reference 6.14). However, the evaluation of the significance of such impacts on ecological features are addressed in this chapter.

9.2 Legislation and Policy Framework

National Legislation

9.2.1 The Conservation of Habitats and Species Regulations 2017 (as amended) ("the Habitats Regulations") provide for the designation and protection of a national site network of important high-quality conservation sites that comprise the European sites already designated as part of the Natura 2000 network and the protection of European protected species listed at Annex II of the Habitats Directive[1]. European sites include all Special Areas of Conservation ("SAC"), candidate SACs ("cSAC") proposed by the UK Government to the European Commission before 31 December 2020 ("EU exit day"), sites of community importance ("SCI") placed on a list adopted by the European Commission prior to EU exit day for designation as SACs by the Government, and Special Protection Areas ("SPA") for wild birds. Updated guidance on Habitats Regulations Assessment was published by the Department for Environment, Food and Rural Affairs, Natural England, Welsh Government and Natural Resources Wales on 24 February 2021. This confirms that as a matter of policy, the protection afforded by law to European sites is also afforded as a matter of policy to proposed SACs, potential SPAs, Ramsar sites, which are wetlands of international importance designated under the Ramsar Convention, and areas secured as sites compensating for damage to a European site.

9.2.2 The DCO Scheme runs through the Avon Gorge Woodlands SAC along the Portbury Freight Line. The permanent works for the DCO Scheme also lie within 80 m of the Severn Estuary SPA/SAC/Ramsar site (30 m during construction) and within 30 km of six European designated sites with bats as a qualifying feature; the North Somerset and Mendip Bats SAC (9 km to the south), Wye Valley Woodlands SAC (c18.5 km to the north), Wye Valley and Forest of Dean Bat sites SAC (c19 km to the north), Mendip Limestone Grasslands SAC (c21 km to the south), Mells Valley SAC (c24 km to the south) and Bath and Bradford-on-Avon Bats SAC (c22 km to the east). A report to inform the Habitats Regulations Assessment ("HRA") has been

[1] Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

undertaken and is presented in Appendix 9.12 Report to Inform HRA (DCO Document Reference 5.5).

9.2.3 The Wildlife and Countryside Act 1981 (as amended) ("WCA") consolidated and amended domestic legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats ("Bern Convention") and Council Directive 79/409/EEC on the Conservation of Wild Birds ("Birds Directive") in Great Britain. The WCA is the main piece of national legislation which protects animals, plants, and in some cases their habitats in England.

9.2.4 The Protection of Badgers Act 1992 provides that it is an offence to kill, injure, take, possess or cruelly ill-treat a badger, or to damage or interfere with a sett unless a licence is obtained from a statutory authority. Sett interference includes disturbing badgers while they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it.

9.2.5 The Natural Environment and Rural Communities Act 2006 ("NERC Act 2006") extended the biodiversity duty set out in the Countryside and Rights of Way ("CRoW") Act 2000 to public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity. The Duty is set out in Section 40 of the Act, which states that: *"Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity"*. This Act includes lists of Habitats and Species of Principal Importance for England and there is an obligation to implement measures to further the conservation interest of such species and to restore or enhance their populations or habitats.

National Policy

National Policy Statement for National Networks

9.2.6 The Planning Act 2008 Section 104(3) requires the Secretary of State to determine the application for the DCO Scheme in accordance with the National Policy Statement for National Networks ("NPSNN"), unless specified factors provide otherwise. The NPSNN advises on biodiversity and ecological conservation in the context of national networks. Table 9.1 below identifies those policies of direct relevance to this assessment and the location where they are considered in the ES.

Table 9.1: Summary of relevant NPSNN advice regarding ecology and biodiversity

Summary of NPSNN provisions	Consideration within the ES
Paragraph 5.22 states that the ES should set out the likely significant effects on internationally, nationally and locally designated sites of ecological or geological importance, protected species, habitats and species of principal importance for the conservation of biodiversity and consider potential impacts on ecosystems.	Section 9.6 presents the findings of the assessment on ecological designated sites. Impacts on geologically designated sites are assessed in Chapter 10 Geology, Hydrogeology, Ground Conditions and Contaminated Land (DCO Document Reference 6.13).

Table 9.1: Summary of relevant NPSNN advice regarding ecology and biodiversity

Summary of NPSNN provisions	Consideration within the ES
Paragraph 5.23 states that the applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.	Section 9.5 summarises measures incorporated into the DCO Scheme and Section 9.7 presents the environmental mitigation measures. Chapter 10 presents information on Geology, Hydrogeology, Ground Conditions and Contaminated Land (DCO Document Reference 6.13).

National Planning Policy Framework

9.2.7 The National Planning Policy Framework ("NPPF") (Ministry of Housing, Communities and Local Government, 2019) does not contain specific policies for Nationally Significant Infrastructure Projects ("NSIP"). However, NPPF paragraph 5 notes that applications for NSIPs are to be determined in accordance with the decision-making framework set out in the Planning Act 2008 and relevant National Policy Statements "*and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework)".* The Chapter 15 of the NPPF advises on the conservation and enhancement of the natural environment. In addition to being concerned with the protection of statutorily designated sites, the NPPF outlines ways in which the planning system is required to contribute to and enhance the local environment and sets out guidance for local authorities in respect of the consideration of biodiversity and green infrastructure, including "*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*" (paragraph 170).

Local Policy

9.2.8 An overview of local policies for North Somerset District Council ("NDSC") and Bristol City Council ("BCC") is presented in Chapter 6 Planning Framework (DCO Document Reference 6.9). Table 9.2 identifies the policies concerned with nature conservation.

Table 9.2: Summary of Local Policy on Nature Conservation

Policy No.	Title	Description
North Somerset District Council Core Strategy, adopted January 2017		
CS1	Addressing climate change and carbon reduction	This is an overarching policy to encourage implementation of measures to reduce CO_2, through design, use of walking, public transport and reuse of land. Items 5) a network of multi-functional green infrastructure will be planned for and delivered through new development…; and 6) protecting and enhancing biodiversity across North Somerset including species and habitats that are characteristic of the area, in order to support adaptation to climate change.
CS4	Nature conservation	This policy promotes the conservation and enhancement of biodiversity through various measures. The biodiversity of North Somerset will be maintained and enhanced by: *"1) seeking to meet local and national Biodiversity Action Plan targets taking account of climate change and the need for habitats and species to adapt to it;* *2) seeking to ensure that new development is designed to maximise benefits to biodiversity, incorporating, safeguarding and enhancing natural habitats and features and adding to them where possible, particularly networks of habitats. A net loss of biodiversity interest should be avoided, and a net gain achieved where possible;* *3) seeking to protect, connect and enhance important habitats, particularly designated sites, ancient woodlands and veteran trees;* *4) promoting the enhancement of existing and provision of new green infrastructure of value to wildlife;* *5) promoting native tree planting and well targeted woodland creation, and encouraging retention of trees, with a view to enhancing biodiversity."*
North Somerset, Development Management Policies, Sites and Policies Plan, Part 1, adopted July 2016		
DM8	Nature Conservation	This policy seeks to protect and enhance biodiversity, particularly on sites of recognised nature conservation interest. It aims to protect trees, hedges and other landscape features of amenity value and to secure suitable replacements in instances where their loss is justified.

Table 9.2: Summary of Local Policy on Nature Conservation

Policy No.	Title	Description
		Development which would have an adverse impact on sites of international importance, which include SAC, SPA and Ramsar sites will not be permitted. The Policy specifically mentions the North Somerset and Mendip Bats SAC consultation area and the Severn Estuary SAC, SPA and Ramsar site. Developments that would have a significant effect on local nature reserves and local sites would not be permitted, unless the harm can be mitigated. Developments that would harm legally protected species and habitats or Species or Habitats of Principal Importance in England (Section 41 or 'priority' species and habitats) will not normally be permitted unless the harm can be avoided or mitigated by appropriate measures. Planning applications need to be accompanied by an up to date ecological survey assessment.
DM9	Trees and Woodlands	This policy seeks to incorporate existing trees and wooded areas into design proposals where practical and ensure that the planting of new trees is properly designed and adequately maintained in the longer term and recognise the place-making quality of trees.
North Somerset Council, 2005. Biodiversity and trees: Supplementary Planning Document.		
North Somerset Council, 2018. North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document.		
The Supplementary Planning Document provides advice aimed at developers, consultants, and planners involved in planning and assessing development proposals in the landscapes surrounding the North Somerset and Mendip Bats SAC to provide a clearer approach to considering impacts of development on the SAC.		
Bristol Development Framework Core Strategy, adopted June 2011		
BCS9	Green Infrastructure	Bristol City Council aims to increase the connectivity of the strategic green infrastructure network, retain and prevent its loss.
Bristol Local Plan, Site Allocations and Development Management Policies, adopted July 2014		
DM17	Development involving existing green infrastructure	The Core Strategy seeks to conserve existing green infrastructure assets. This policy sets out the detailed approach to this where further detail to support the Core Strategy is required.

Table 9.2: Summary of Local Policy on Nature Conservation

Policy No.	Title	Description
DM19	Development and Nature Conservation	This policy seeks to ensure that consideration is given to the likely impact that development could have upon habitat, species or features, which contribute to nature conservation in Bristol, and that appropriate mitigation is provided where such impacts would occur.

9.2.9 There are various biodiversity action plans relevant to this DCO Scheme. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*, (Defra, 2011), is the most recent biodiversity strategy for England (replacing the UK BAP following the publication of the *UK Post-2010 Biodiversity Framework* published by JNCC and Defra in July 2012).

9.2.10 The *Action for Nature North Somerset Biodiversity Action Plan* (NSC, 2005) ("NSBAP") and the *Bristol BAP* ("BBAP") (BCC, undated) identify priority habitats and species and set targets for their conservation. This includes habitats and species of relevance to the DCO Scheme, such as woodland, standing open water, rivers and streams, greater horseshoe bat *Rhinolophus ferrumequinum* and hedgehog *Erinaceus europaeus*.

9.3 Methodology

Guidance and Best Practice

9.3.1 The ecological impact assessment has been undertaken using the *Guidelines for Ecological Impact Assessment in the UK and Ireland* produced by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018). It also considers Department for Transport guidelines in the *Design Manual for Roads and Bridges* ("DMRB"), Volume 11 Environmental Assessment, Section 3, Part 4 Ecology and Nature Conservation (Department for Transport 1993)[2]. Drawing on the CIEEM guidelines, the assessment methodology has been adapted to use a matrix approach, which is consistent with other chapters in this ES and does not change the assessment of likely significant effects.

Consultations

9.3.2 A summary of consultations undertaken to date is presented in Table 9.3. Further information on the consultation process is presented in Chapter 5 Approach to the Environmental Assessment (DCO Document Reference 6.8). Responses to consultation exercises undertaken in 2015 and 2017 are available on the MetroWest project website at the following address http://travelwest.info/metrowest and the Consultation Report is provided in DCO Document Reference 5.1.

[2] DMRB has been recently revised and reissued. This assessment followed the Department for Transport guidance referenced in the text.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Scoping Opinion Responses (August 2015)		
Planning Inspectorate	Paragraph 3.29. Further information is required to scope out the cumulative effects of the other works on MetroWest Phase 1 with *inter alia* ecology and biodiversity.	Consideration for the cumulative effect of the DCO Scheme with other schemes is reported in Section 9.8 of this Chapter and in Chapter 18 In-combination of Cumulative Effects Assessment (DCO Document Reference 6.21) and the accompanying Appendices 18.1 and 18.2 (DCO Document Reference 6.25).
	Paragraph 3.45. Careful assessment of impacts on a range of receptors (designated sites, protected species and habitats).	Consideration throughout this Chapter.
	Paragraph 3.46. Agree the assessment methodology with Natural England and other relevant consultees.	Natural England has been consulted a number of times with regards to the methodology for assessment of the works and where applicable these recommendations have been incorporated into the ES.
	Paragraph 3.47. Design and likely effectiveness of mitigation should be agreed with Natural England.	Natural England has been consulted with regards to the design and development of mitigation.
	Paragraph 3.48. Assess the impact of the railway as part of the wider ecological network.	It is recognised that the railway represents an important connection and dispersal corridor for a number of species and this is considered within Section 9.6 of this Chapter.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
	Paragraph 3.49. Consider the need for a HRA.	The need for a HRA is discussed within this document and an HRA report is presented in Appendix 9.12 Report to inform HRA (DCO Document Reference 5.5).
	Paragraph 3.50. Agree a methodology for an arboricultural survey and assessment with the relevant local tree officer and include the results in the ES. Clarify whether any of the trees that are likely to be affected are subject to Tree Preservation Orders ("TPO").	Discussions have been held with the NSDC Tree Officer. A preliminary arboricultural assessment of trees in the Avon Gorge has been undertaken. This assessment has identified a number of trees which are a potential safety risk for the existing operational freight line. Network Rail ("NR") has been informed of the location of these features. TPOs are identified on Figure 11.1 in ES Volume 3 Book of Figures (DCO Document Reference 6.24). No trees subject TPOs are anticipated to be affected by the DCO Scheme.
	Paragraph 3.51. Address the implications of the potential spread of invasive species.	A number of invasive species have been identified within and adjacent to the site. Management of these species has been considered in the Master Construction Environmental Management Plan ("CEMP") Appendix 4.2 in the ES (DCO Document Reference 8.14).
	Paragraph 3.52. Consider the potential impact from disturbance of wildlife due to piling.	Considered within this document in Section 9.6.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
	Paragraph 3.53. Take account of inter-relationships between impacts on noise, vibration, air quality (including dust), soil quality and water quality on ecological receptors. Cross refer to relevant topic chapters.	Considered within this document in Section 9.6.
Natural England	Natural England is generally satisfied with the approach to the assessment in the Scoping Report.	Noted.
	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 this Chapter and in Appendix 9.2 Bat Technical Appendix (DCO Document Reference 6.25).
	Natural England advises that a habitat survey (equivalent to Phase 2) is carried out on site.	A flora survey has been completed in the Avon Gorge Woodlands SAC (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.
	Natural England advises that ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year.	An Extended Phase 1 Habitat survey and ornithological surveys were undertaken and are documented in Appendices 9.1 and 9.3 (DCO Document Reference 6.25). An invertebrate survey was carried out in 2011 by another party for the disused section of the railway line and has informed this assessment. Further invertebrate surveys were not carried out as explained in paragraph 9.4.66.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
	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 Appendix 9.11 Avon Gorge Vegetation Management Plan ("AGVMP") (DCO Document Reference 8.12) and Appendix 9.12 Report to Inform HRA (DCO Document Reference 5.5). The benefits of the development are discussed in Appendix 9.12 Report to Inform HRA (Section 10).
	Portbury Nature Reserve. Consider the indirect effect of the DCO Scheme on birds in the Severn Estuary designated site.	The indirect impact of the DCO Scheme on birds is considered in Section 9.6 of this chapter.
	Avon Gorge Woodlands SAC (and Avon Gorge Site of Scientific Interest "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. 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 and management 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 (DCO Document Reference 6.7) and the impacts of the DCO Scheme are considered in Section 9.6 of this chapter. Appendix 9.11 AGVMP (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 and includes compensation measures such as planting rare whitebeam saplings.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
	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 on horseshoe bats in relation to the two bat SACs (Mendip and Bath and Bradford 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 (DCO Document Reference 6.25). Consideration of the potential impacts is provided in Section 9.6 of this chapter. A HRA report is presented in Appendix 9.12 Report to Inform HRA (DCO Document Reference 5.5) of the ES.
	If a European Protected Species ("EPS") licence is likely to be required, a shadow licence should be in place prior to DCO submission.	Shadow licence applications are being prepared for badger, bats and great crested newts, which would be submitted to Natural England under current EPS licensing arrangements. Alternatively, NSDC as promoters of the DCO Scheme could apply for consent under Natural England's District Level Licensing ("DLL") scheme for great crested newts.
	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 this chapter.
North Somerset Levels Internal Drainage Board	The North Somerset Levels Internal Drainage Board would like to ensure that no permanent loss or damage of habitat arises as a consequence of the development, and they would be keen to agree appropriate replacement/mitigation with the applicant where this cannot be avoided.	The effects on habitats are set out in Section 9.6, with mitigation proposed in section 9.7 of this chapter. Further consultation is described in Chapter 17 Water Resources, Drainage and Flood Risk (DCO Document Reference 6.20).

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Bristol City Council	Ecological mitigation should address legally protected species and priority species and habitats found in surveys.	A number of measures to avoid or reduce effects and to comply with the legal framework have been developed in consultation with the regulatory authorities and are presented in Section 9.5 and 9.7 of this chapter.
	Comments were made on the Severn Beach / Avonmouth Signalling and Bedminster Down Relief Line.	These do not form part of the DCO Scheme because they are permitted development and the comments on these schemes have not been considered here.
Environment Agency	Include otter assessments / surveys particularly in respect of breeding sites and use of any areas near watercourses. Appropriate mitigation will be required during construction, including covering work holes/trenches at night. Provision of otter passes must be considered.	Otter survey and assessment completed for the DCO Scheme and included in the ES in Section 9.6 of this chapter and in Appendix 9.8 Otter Survey (DCO Document Reference 6.25). Mitigation for otters has been considered in the Master CEMP Appendix 4.2 (DCO Document Reference 8.14) and Section 9.7 of this chapter. Otter passes are not considered necessary to mitigate the impact of the DCO Scheme. Detailed responses to the Environment Agency comments are provided in the Consultation Report in DCO Document Reference 5.1.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Informal Stakeholder Consultation		
Natural England Meeting on 30th September 2014 (Senior Planning Adviser Somerset, Avon & Wiltshire Team)	Informal consultation during 2014 on the proposed assessment methodology resulting in a response from the Discretionary Advice Service ("DAS").	The DAS response is appended to the Scoping Report, available on the Planning Inspectorate's Portal for NSIPs.
Informal micro-consultation on DCO scheme boundary (22 June to 3 August 2015)		
North Somerset Levels Internal Drainage Board	There should be no permanent loss or damage of habitats, with any replacement/mitigation agreed with North Somerset Levels Internal Drainage Board.	The effects on habitats are set out in Section 9.6 of this chapter, with mitigation proposed in 9.7 of this chapter. Further consultation is described in Chapter 17 Water Resources, Drainage and Flood Risk (DCO Document Reference 6.20).
Informal Stakeholder Consultation		
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 Natural England. The vegetation clearance and surveys of structures was completed in 2016.
Natural England	A number of consultation meetings have been held with the Natural England ("NE") Team through the Discretionary Advice Service ("DAS").	Considered in Section 9.6 of this chapter and the Master CEMP (Appendix 4.2, DCO Document Reference 8.14).

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
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:** NE 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, 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 the Forestry Commission ("FC"), to further the conservation objectives of the Avon Gorge. **North Somerset and Mendip Bats SAC:** NE recognises 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 corridor for bats with movement between the line and Brockley Hall Stables SSSI, a link with the North Somerset and Mendip Bats SAC. Accordingly, NE requested that an additional radio tracking survey for bats be undertaken to further understand the importance of the rail corridor.	Positive opportunities have been incorporated into the development of the AGVMP (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 Statement ("SMS"), vegetation management plan and HRA for the Avon Gorge, 2018; Appendix 9.15, DCO Document Reference 6.25). Detailed responses to the Environment Agency comments are provided in the Consultation Report in DCO Document Reference 5.1.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
	Protected Species: NE has broadly accepted the approach to protected species and has been made aware that licences will be required for bats, badgers, dormice and great crested newts ("GCN"). NE has asked that a summary of this approach and the likely time frame for the application of licences be sent to their central licensing team for consideration.	Additional radio tracking bat surveys were undertaken in June 2018 and the results are included in Appendix 9.2 Bat Technical Appendix (DCO Document Reference 6.25). Shadow licences are being prepared for bat, badger and great crested newts. During the detailed design stage for construction works to third party rock faces within the Avon Gorge Woodlands SAC, the sites will be assessed for dormouse potential and if there is any potential to affect dormice (including disturbance) the Applicant or the Contractor (depending on the programme) will submit and obtain a licence in advance of the licensable activities commencing, if necessary. Detailed responses to Natural England comments are provided in the Consultation Report in DCO Document Reference 5.1.
Natural England Avon Gorge Walk through, 15 December 2016	One of NE's National Plant Specialist participated in a walkthrough of the Avon Gorge on the 15th of December 2016. 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 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 Appendix 9.11 AGVMP (DCO Document Reference 8.12).

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Natural England Teleconference to discuss the GCN draft licence and use of EPS Policy 1, 29 January 2018 (Wildlife Adviser Somerset, Avon & Wiltshire Team)	NE required further justification of ponds scoped out. Require another survey of waterbodies to update the survey results. Provided advice on use of EPS licence policy 1.	Justifications of the ponds scoped out of the GCN assessment is provided in Appendix 9.4 Great Crested Newt Survey Report (DCO Document Reference 6.25). A survey will be undertaken prior to final EPS licence submission. The areas proposed for compensation habitat were reviewed and an additional area north of the disused line near Sheepway will be included in the Application for the GCN EPS licence. Detailed responses to the Environment Agency comments are provided in the Consultation Report in DCO Document Reference 5.1.
Natural England Meeting to discuss the draft Avon Gorge Vegetation Management Plan, 7th June 2018 (Severn Avon Mendip Team member and Plant Specialist)	NE had no objection to the draft plan and the main concern lies in the errors and inconsistencies in the description of the botanical interest of the site. NE recommends identifying more than 1 site for planting rare whitebeam saplings, investigate the use of cuttings to propagate Avon Whitebeam *Sorbus avonensis* and asks that surplus propagated material from more widespread species should be offered to the SSSI landowners for planting.	Appendix 9.11 AGVMP (DCO Document Reference 8.12) updated to remove errors and inconsistencies in the description of the botanical interest of the site. Additional planting sites for rare whitebeam saplings have been agreed with NR and cuttings of Avon Whitebeam have been collected for propagation in October 2019.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Natural England Meeting to discuss Quarry Underbridge 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, 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.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Natural England Teleconference to discuss Quarry Underbridge No. 2 site compound, 14th February 2019 (Severn Area Mendip Team member).	NE had concerns with the compound size and the removal of log piles and boulders. NE asked if the bridge works could be done from the railway. NE was concerned about trespass in the ex-rifle range. This is an existing problem.	The size of the compound is already constrained for the works required, but there would be positive management elsewhere at a ratio of 2:1 to mitigate for this. This is explained in the AGVMP (DCO Document Reference 8.12). The works may be able to be completed from the track but this won't be known until the detailed design stage. Mitigation by fencing the construction compound and moving the log piles and boulders has been agreed with NR. The mitigation for the impact in the Quarry is positive management on NR land as the National Trust have done a lot of improvements to their land already. Appendix 9.11 AGVMP (DCO Document Reference 8.12) updated to detail potential further mitigation measures for the site compound and NR to consider these at the detailed design stage. NR to review fencing around the ex-rifle range during the detailed design stage.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Natural England Teleconference to discuss the draft HRA, 21st March 2019 (Severn Area Mendip Team member).	NE wants 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 Appendix 9.12 Report to Inform HRA (DCO Document Reference 5.5). Further work to assess and provide mitigation for the operational lighting impacts at Pill Station has been undertaken and is detailed in Sections 9.6 and 9.7 of this chapter and Appendix 9.17 and 9.18 (DCO Document Reference 6.25).
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 (recent) woodland. There was a question about how suitable the Clifton Bridge No. 2 Tunnel planting site would be. NE wanted to know what NR is committing to through their SMS. NE will check on a draft licence for Bristol rock-cress.	Further surveys and clarification of planting on the three whitebeam planting sites has been completed and is included in Appendix 9.11 AGVMP (DCO Document Reference 8.12). A translocation and planting strategy has been developed for Bristol rock-cress and is included in Appendix 9.11 AGVMP (DCO Document Reference 8.12).

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
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 and compensation in the AGVMP from NR's SMS 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 the 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.	Appendix 9.11 AGVMP and 9.12 Report to Inform HRA (DCO Document References 8.12 and 5.5) updated to separate NR's existing responsibilities from the mitigation and compensation proposed for the DCO Scheme. DCO Scheme project team worked with NE and the FC to identify priority areas for positive management outside of the railway corridor. Appendix 9.11 AGVMP and 9.12 Report to Inform 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. Further surveys and clarification of planting on the three whitebeam planting sites has been completed (Appendix 9.11 AGVMP). A site visit was also undertaken in February 2020 with the National whitebeam experts. A meeting was undertaken on the 23rd May with the FC. 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 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Natural England NE DAS response following review of draft documents: • ES Appendix 9.11 Avon Gorge Management Plan • ES Chapter 9 Ecology and Biodiversity • ES Appendix 9.12 HRA • ES Chapter 11 LVIA • ES Appendix 9.2 MetroWest Bat Report • GRIP 3 minor civils drawings 7th June 2019 (Severn Area Mendip Team member)	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 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.	Appendix 9.12 Report to Inform HRA (DCO Document Reference 5.5) 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) and 9.12 (Report to Inform HRA). Further clarification given in Appendix 9.12 (Report to Inform HRA) about 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 Appendix 9.16 The Portbury Hundred Tree Planting (DCO Document Reference 6.25).

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
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 FC)	Compensation for impacts from the DCO Scheme could be undertaken outside of the SAC, reducing 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.	Appendix 9.11 AGVMP and 9.12 Report to Inform HRA (DCO Document References 8.12 and 5.5) 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.
Forestry Commission Meeting to discuss undertaking positive management on FC land as an alternative to NR land, 20th June 2019 (Beat Forester, Bristol and Savernake West England Forest District, Forestry England)	See above	See above

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
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 AGVMP and 9.12 Report to Inform HRA (DCO Document References 8.11 and 5.5) 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. Detailed responses to the FC comments are provided in the Consultation Report in DCO Document Reference 5.1.
Forestry Commission	Requested co-ordinating the DCO Scheme's works with theirs to share some of the track possessions required. Concerns raised around the timings for use of their access track for geo-technical works, needing to ensure it was around ecology seasons to avoid nesting birds and dormice. Stated that a method statement, risk assessment and indemnity statement would be required.	NR may supply possessions as part of their SMS because the FC would prefer the works to be carried out in advance of the DCO Scheme works. Dormice in wider woodland discussed in Section 9.4 of this chapter. Impact from the use of FC access tracks considered in Section 9.6 of this chapter. Detailed responses to FC comments are provided in the Consultation Report (DCO Document Reference 5.1).

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
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 are broadly content with the approach but have asked that measures to enhance the ecological setting of the route be considered wherever possible for example that disused railway structures be retained and protected to support roosting features for bats and that herbicide is not used on the rail corridor in close proximity to any of the non-statutory and statutory designated sites during the operation and construction of the DCO Scheme.	Measures have been developed in consultation with stakeholders to mitigate predicted likely significant effects of the DCO Scheme. These are presented in Section 9.7 of this chapter. Enhancement measures are not assessed for the ES. NR have to use herbicide to maintain safe operation of the railway. However, herbicide is hand sprayed in the Avon Gorge Woodlands SAC to avoid impacts on protected species as part of the SMS agreed with NE.
Avon Wildlife Trust ("AWT") Informal Consultation	AWT provided species information for Portbury Wharf Nature Reserve. Discussed mitigation measures for Sheepway maintenance compound and potential compensation schemes in partnership with AWT.	Species information are included in Appendices 9.3, 9.4 and 9.5 (DCO Document Reference 6.25). Indicative planting is shown on DCO Document Reference 2.49 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. From 2016, the management of the Portbury Wharf Nature Reserve was handed over from AWT to NSDC Streets and Open Spaces Team.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Formal Stage 2 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 SSSI / SAC within NR ownership. However, await further project details to be able to advise on the likely significance.	Further project details are confirmed and impacts assessed in Section 9.6 of this chapter and Appendix 9.11 AGVMP (DCO Document Reference 8.12).
Natural England	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 provided for statutory consultation (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 this chapter and Appendix 9.11 AGVMP and 9.12 Report to Inform HRA (DCO Document References 8.12 and 5.5).

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
	Concerned of the effects of the proposed fencing through the Avon Gorge to the landscape and visual impacts, both during operation and its installation.	Fencing is required to prevent trespass which is a greater issue with the introduction of faster, more frequent passenger services. Some of the fencing requirements were de-scoped at outline design to reduce the amount of vegetation clearance required and more fencing may be de-scoped during the detailed design of the DCO Scheme (Governance for Railway Investment Projects ("GRIP 5"). There are, however, benefits to fencing by managing public access and disturbance to the SAC, which is highlighted as a pressure/threat in the Site Improvement Plan. In addition, and to address visual amenity concerns paladin (mesh) fencing has been chosen to lessen its visual impact. The impact of new equipment and design/finishes of fencing is considered in the ES Chapter 11 Landscape and Visual Impacts Assessment (DCO Document Reference 6.14), Section 11.6.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
Natural England	Regarding bats: • Ecology and Biodiversity is slightly confused in terms of references to horseshoe bats. • Support 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. • The information is incomplete in relation to hibernation sites because surveys are ongoing. • Surveys need to be completed before the importance of the tunnels or the likely impacts on them is confirmed.	Appendix 9.2 Bat Technical Appendix (DCO Document Reference 6.25) amended regarding horseshoe bats. Further bat surveys completed and provided in Appendix 9.2 Bat Technical Appendix and used in the ES to determine importance of the site to bats and likely impacts (See Section 9.4 and 9.6 of this chapter).
Environment Agency	Mitigation for impacts on watercourses and otters needs to be confirmed. The Environment Agency would welcome clarification in respect of habitat creation/enhancement proposals.	Mitigation measures detailed in the Section 9.5 of this chapter and Master CEMP Appendix 4.2 (DCO Document Reference 8.14) to minimise disturbance on otters and impacts on watercourses. Habitat creation clarified in the ES e.g. landscape planting and GCN compensation (Environmental Masterplan, DCO Document Reference 2.53).
NSDC	Overall generally agree with the scope, valuation and assessment of ecological receptors. Key concerns/highlights: • valuation of GCN as ecological receptor in the Ecological Impact Assessment (“EcIA”) • identification of suitable reptile receptor site(s)	This chapter presents the methodology to the assessment, the existing baseline, impact assessment and proposed mitigation. This is support by Appendices 9.1 to 9.18 (DCO Document Reference 6.25).

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
	• consideration of lighting mitigation in tunnels (bats) Would welcome commitment to local wildlife refuge enhancements along the route – e.g. hibernacula and roosting provisions. It is also considered that new bridge structures present opportunities for incorporating bat roosting/species specific nesting provisions. Specific queries on: • Section 41 Priority habitats and species, e.g. common toad and hedgehog. • Summary of sites / qualifying species being screened for TOLSE. • HRA screening of bat SACs • Section 41 priority habitats and species • Habitats: wet woodland • Amphibians: Great crested newts • Dormouse mitigation • Grass snake • Invertebrates • Wildlife and Countryside Act Schedule 9 plants • HRA Avon Gorge Woodlands • HRA Severn Estuary SPA / Ramsar site • Bats • Watercourses and sustainable drainage systems • Water vole • Birds	Detailed responses to NSDC are provided in the Consultation Report in DCO Document Reference 5.1.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
	• Seasonal constraints on construction works • Herbicide use Comments on Appendices 9.1 Phase 1, 9.3b Wintering Bird Surveys on Pill Marshes, 9.4 GCNs and Appendix 9.5 Reptiles.	
Bristol City Council	A shadow Appropriate Assessment would be required under the Habitats Regulations to avoid an adverse effect on the qualifying interest features. The Nature Conservation Officer recommended that planning requirements are included as part of the DCO; including a CEMP, and ecological mitigation and enhancement strategy and a nature conservation management plan for the Avon Gorge Woodlands SAC. Method statements for reptile mitigation and details of external lighting are also requested.	The ES includes Appendix 4.2 Master CEMP (DCO Document Reference 8.14), Appendix 9.11 AGVMP (DCO Document Reference 8.12), Appendix 9.12 Report to Inform HRA (DCO Document Reference 5.5), Appendix 9.14 Reptile and Amphibian Mitigation Strategy (DCO Document Reference 6.25) and Appendix 9.17 Lighting survey (for the disused railway line near Court House Farm and Pill Station) (DCO Document Reference 6.25). The AGVMP and Report to Inform HRA summarise the mitigation and compensation (positive management) measures to be undertaken in the Avon Gorge Woodlands SAC. The Master CEMP includes good practice measures to impact construction impacts on biodiversity. Detailed responses to the BCC comments are provided in the Consultation Report in DCO Document Reference 5.1.

Table 9.3: Summary of consultation responses

Organisation and date	Summary of response	Consideration within ES
National Trust	Works to Quarry Underbridge No. 2 will reduce the height to under 1.9 metres. In the future we hope to graze the former Quarry area (which is part of the Avon Gorge Woodlands SAC) but this will be very difficult if the access is restricted as livestock vehicles will not be able to get into the quarry.	The current proposals for the DCO Scheme are to reconstruct Quarry Underbridge No. 2. This will preserve the headroom requested by the National Trust.
Clifton Suspension Bridge	Vegetation clearance in the Gorge - raised concerns about the level of possible vegetation clearance and that the height of the clearance is determined to maintain as much of the canopy as possible to maintain the 'magnificent views' from the Bridge, a key attraction of the structure.	Vegetation clearance clarified in Section 9.6 of this chapter and Appendix 9.11 AGVMP (DCO Document Reference 8.12) and will be the minimum required for construction and operation of the DCO Scheme and compensate for impacts on the Avon Gorge Woodlands SAC. Also refer to Chapter 11 Landscape and Visual Impact Assessment (DCO Document Reference 6.14).
Public	Concerns for loss of wildlife on the strip of land behind houses needed for the ramp for Pill Station and forecourt.	This strip of land is part of a private garden which is overgrown. A pre-construction survey will be undertaken for this area in accordance with the Master CEMP, Appendix 4.2 (DCO Document Reference 8.14).

Definition of the Study Area

9.3.3 The study area for the DCO Scheme focuses on the Order limits as shown on the General Arrangement Plans (DCO Document Reference 2.4) defined by the Order limits around the DCO Scheme from the proposed new station in Portishead to Ashton Junction. A biological records search for species and local wildlife sites was obtained for a 0.5 km buffer around the centreline of the railway. Consideration has also been given to potential effects on nationally designated sites within 2 km and internationally designated sites within 5 km (30 km for sites with bats as a qualifying feature).

9.3.4 The study area has been divided into Portishead to Pill (disused line) and Portbury Freight Line due to the differences in the DCO Scheme for each section and differences in baseline ecology.

9.3.5 The cumulative effects section covers proposed NSIPs within 10 km, development proposals submitted to the local planning authorities within 0.5 km of the DCO Scheme centreline, other works required for MetroWest Phase 1 comprising Parson Street Junction (including Liberty Sidings), Parson Street Station, the Bedminster Down Relief Line, Severn Beach / Avonmouth Signalling and Bathampton Turnback, and other developments agreed with NSDC and BCC. Information on the other projects considered for the cumulative effects assessment is provided in Appendices 18.1 (Matrix 2) and 18.2 (Matrix 1) (DCO Document Reference 6.25). Additional background information on the Bedminster Down Relief Line, Severn Beach / Avonmouth Signalling and Bathampton Turnback is available in the Baseline Report, Appendix B, which can be downloaded from The Planning Inspectorate's website at the following address https://infrastructure.planninginspectorate.gov.uk/projects/south-west/portishead-branch-line-metrowest-phase-1/. The works required to implement the Severn Beach / Avonmouth Signalling scheme have been implemented by NR under their permitted development rights as part of the Filton Four Track project, however, the increased services are not expected to commence until 2021.

9.3.6 The study area is considered sufficient to include the likely zone of influence of the DCO Scheme on habitats, flora and fauna.

Key Features

9.3.7 The key features for the ecological impact assessment are:

- Internationally designated sites – SPA, SAC, and Ramsar sites
- European protected species (bats and great crested newts *Triturus cristatus* are present in the study area)
- Nationally protected sites – SSSI and National Nature Reserves ("NNR")
- Locally designated sites – Sites of Nature Conservation Interest ("SNCI"), and County Wildlife Sites ("WS")
- Nationally protected species e.g. badgers and plants protected under Schedule 8 of the WCA.
- Ancient Woodland as shown on Natural England's Inventory
- The green corridor provided by trees and scrub along the disused line.

Defining the Baseline

9.3.8 Information on ecology was obtained from the following sources.

- Bristol Regional Environmental Records Centre ("BRERC"). A data search was undertaken in April 2014 for records of protected and priority species in the UK, locally important species of conservation concern and statutory and non-statutory designated sites of nature conservation interest. The search area was a 0.5 km buffer from the centreline of the railway for all protected species records (extended to 2.5 km for bats) and locally designated sites, a 2 km buffer for nationally designated sites, and a 5 km buffer for internationally designated sites, except for those international sites with bats as a qualifying feature where the buffer was extended to 30 km. The data search was supplemented by site specific surveys since 2014.
- The Multi-Agency Geographic Information for the Countryside (“MAGIC”) website (www.magic.gov.uk).
- Adjacent land owners including the National Trust and the FC.
- North Somerset Council Ecologists.
- NE and Joint Nature Conservation Committee ("JNCC") Protected Site data.

9.3.9 Ecological and lighting surveys were undertaken for the DCO Scheme between 2011 and 2020. The reports detailing the findings of the surveys and subsequent recommendations have formed part of the basis for the ecological impact assessment. The reports used within this assessment are listed below.

- Appendix 9.1: Extended Phase 1 Habitat Survey (DCO Document Reference 6.25)
- Appendix 9.2: Bat surveys (DCO Document Reference 6.25)
- Appendix 9.3: Ornithological Surveys (9.3c Schedule 1 species CONFIDENTIAL) (DCO Document Reference 6.25)
- Appendix 9.4: Great Crested Newt Survey (DCO Document Reference 6.25)
- Appendix 9.5: Reptiles (DCO Document Reference 6.25)
- Appendix 9.6: Badgers CONFIDENTIAL (DCO Document Reference 6.25)
- Appendix 9.7: Dormice (DCO Document Reference 6.25)
- Appendix 9.8: Otters (DCO Document Reference 6.25)
- Appendix 9.9: Water Voles (DCO Document Reference 6.25)
- Appendix 9.10: 9.10 Flora Survey: Avon Gorge Woodlands SAC / Avon Gorge SSSI (DCO Document Reference 6.25)
- Appendix 9.11: AGVMP (DCO Document Reference 8.12)
- Appendix 9.12: Report to Inform HRA (DCO Document Reference 5.5)

- Appendix 9.13: Reptile and Amphibian Mitigation Strategy (DCO Document Reference 6.25)
- Appendix 9.14: Hedgerow Survey, Lodway Compound (DCO Document Reference 6.25)
- Appendix 9.15: NR Site Management Statement, Vegetation Management Plan and HRA for the Avon Gorge (DCO Document Reference 6.25)
- Appendix 9.16: The Portbury Hundred proposed tree planting (DCO Document Reference 6.25)
- Appendix 9.17: Lighting survey (DCO Document Reference 6.25)
- Appendix 9.18: Lux lighting plans for Pill Station car park and highways (DCO Document Reference 6.25)

Assessment of Construction and Operational Impacts

9.3.10 In accordance with CIEEM guidance (CIEEM 2018), the following factors were considered in determining the potential ecological impacts of the activities associated with the construction and operation of the proposed development:

- Extent;
- Magnitude;
- Duration;
- Reversibility;
- Timing and frequency; and
- Cumulative effects.

9.3.11 The guidelines allow for features to be scoped out of the impact assessment. They advise that features to be subject to more detailed assessment should be both of sufficient importance that impacts upon them may be significant and potentially vulnerable to significant impacts arising from the development. This approach is consistent with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) ("EIA Regulations 2017"), which require the provision of information on likely significant effects. For the purposes of this assessment, the level of importance of a feature below which it is considered that no likely significant effects would be predicted, whether adverse or beneficial, is set at **District** importance. Therefore, impacts will be assessed in detail only for features of at least district (or Unitary Authority) importance or subject to some form of legal protection, for example, under the WCA, the Protection of Badgers Act 1992 and Habitats Regulations.

Assessment of Decommissioning Impacts

9.3.12 Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7) explains that consideration has been given to likely significant effects arising during the decommissioning phase. However, owing to the nature and life span of the proposed development, the regulated process of any closure in the future, which would be overseen by the Office of Rail and Road, and there being no reasonably foreseeable decommissioning proposals such that likely impacts could be identified and assessed, these effects are not considered further in this chapter.

Assessment of Cumulative Effects

9.3.13 Effects are unlikely to be significant where features of low importance or sensitivity are subject to small or short-term impacts. However, where there are a number of small scale effects on a feature that are not significant alone, the assessor may determine that, cumulatively, these may result in an overall significant effect. It is also necessary to assess multiple effects on the same features, other works associated with the MetroWest Phase 1 project such as Bathampton Turnback and other developments for which planning consent has been granted along the DCO Scheme route.

Habitats Regulations Assessment

9.3.14 As the Portbury Freight Line passes close to and through European designated sites, the Report to Inform HRA has been prepared in accordance with the requirements of the Conservation of Habitats and Species (England) Regulations 2017 (as amended) and the Planning Inspectorate's Advice Note 10: *Habitats Regulations Assessment relevant to nationally significant infrastructure projects.* The first draft of the HRA screening report was presented in the Scoping Report which was issued to the Planning Inspectorate in June 2015 and is available on their planning portal. Since then, the Report to Inform HRA has been further developed and is presented in Appendix 9.12 (DCO Document Reference 5.5).

Use of Significance Criteria

9.3.15 The significance of likely impacts has been determined through a three-stage process:

- identifying the ecological features likely to be affected and determining their importance;
- determining the magnitude and nature of impacts; and
- characterising the nature of the individual and combined impacts on each important feature, to determine significant effects for the feature in terms of ecological structure and function.

Importance of Ecological Features

9.3.16 The nature conservation importance or potential importance of an ecological feature is determined within the geographic context defined in Table 9.4. The Bat Mitigation Guidelines (Mitchell-Jones, 2004) was used to define the importance of bat roosts.

Table 9.4: Definition of Importance of features

International or European Importance
European sites including: SCI, SPA, pSPA, SAC, cSAC, possible SACs ("pSAC") and Ramsar sites.
UK or National Importance
Nationally designated sites including: SSSI and NNR. Areas of Ancient Woodland e.g. woodland listed within the Ancient Woodland Inventory ("AWI"). Habitats and species of Principal Importance listed on the NERC Act 2006, where relevant. Plants with National Rarity Status of Nationally Rare (found in 1-15 10 x 10 km squares of National Grid) and Nationally Scarce (16-100 10 x 10 km squares).
Regional Importance within South West England
Areas of key/priority habitat identified as being of Regional importance in the Severn and Avon Vales Natural Area or Bristol, Avon Valleys and Ridges Natural Area; areas that have been identified by regional plans or strategies as areas for restoration or re-creation of priority habitats; and areas of key/priority habitat listed within the NSBAP or BBAP. A feature that may contribute to the functionality of strategic flyways used by greater horseshoe bats associated with a site of international importance.
Unity Authority of North Somerset / Bristol City District Importance
Designated sites including: SNCI; County Wildlife Sites and Local Nature Reserves ("LNR") designated in the county or unitary authority area (District) context. Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. Areas of key/priority habitats identified in the Local BAP; and areas of habitat identified in the appropriate Natural Area Profile (or equivalent). Plants with National Rarity Status of Nationally Uncommon (found in 101-250 10 x 10 km squares).
Local Importance
Designated sites including: LNRs designated in the local context. Trees that are protected by TPOs. Areas of habitat; or populations/communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees), including features of importance for migration, dispersal or genetic exchange.
Important in the immediate zone of influence only
Habitat mosaic of grassland and scrub which may support a diversity of common wildlife species.

Source: Adapted from the Highways Agency Interim Advice Note 130/10, Ecology and Nature Conservation: Criteria for Impact Assessment

Magnitude of Impact

9.3.17 Table 9.5 provides a definition of the magnitude of impact.

Table 9.5: Definition of Magnitude of Impact

Magnitude of Impact	Descriptors
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of or damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements, improvement of attribute quality (Beneficial).
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Source: Department for Transport's Design Manual for Roads and Bridges, Volume 11, Section 2, Part 5

Significance of Effect

9.3.18 The significance of the effect is reached through the combination of the importance of the feature and the magnitude of change as shown in Table 9.6 and the significance categories are defined in Table 9.7. A significant effect in relation to the EIA Regulations 2017 is considered to be of moderate or larger significance, whether adverse or beneficial.

Table 9.6: Significance of Effects

Magnitude of Change	Importance of feature				
	International and National	**Regional**	**County and District**	**Local**	**Important in the immediate zone of influence only**
Major	Very Large	Large / Very Large	Moderate / Large	Moderate	Slight
Moderate	Large / Very Large	Moderate / Large	Moderate	Slight	Neutral
Minor	Moderate / Large	Moderate	Slight	Neutral	Neutral
Negligible	Slight	Slight	Neutral	Neutral	Neutral
No Change	Neutral	Neutral	Neutral	Neutral	Neutral

Table 9.7: Definition of the Significance Categories

Significance Category	Typical Descriptors of Effect
Very large	Very large effects represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to undergo major change to key characteristics, features or elements. A major change in a site or feature of local importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or feature.
Slight	These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in influencing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

9.4 Baseline, Future Conditions and Importance of Features

Regional Overview

9.4.1 The ecological importance of the MetroWest wider study area is reflected in the designation of international (e.g. Severn Estuary SAC, SPA, and Ramsar site; the Avon Gorge Woodlands SAC, and North Somerset and Mendip Bats SAC), national (SSSIs and NNR) and local designated conservation sites (e.g. Portbury Wharf Nature Reserve and River Avon).

9.4.2 The MetroWest programme lies within Natural England's Severn and Avon Vales Natural Area (Number 56) and Bristol, Avon Valleys and Ridges Natural Area (Number 62). The Severn and Avon Vales Natural Area is characterised by undulating low-lying land, where the river floodplains regularly flood in winter, including seasonally flooded washland, and there are relict wetland sites and features such as old pollards, wet pastures, ditches and tall hedges. The Bristol, Avon Valleys and Ridges Natural Area is a complex and variable landscape, characterised by alternating ridges and broad valleys with some steep wooded slopes and open rolling farmland. The large urban expanse of Bristol and the limestone Avon Gorge dominate the central part. Elsewhere the area supports parklands of conservation value, limited areas of calcareous grasslands and a number of significant water bodies including reservoirs and some wildlife-rich rivers and streams.

9.4.3 A number of habitats and species of principal importance listed in Section 41 of the NERC Act are also found within the region. These include intertidal mudflats, lowland woodlands, great crested newt and greater horseshoe bat.

9.4.4 The baseline information presented is in two parts: Portishead to Pill and then the Portbury Freight Line. This has been done for two reasons. Firstly, the habitat and landscape between these two sections differs, with the disused section between Portishead and Pill largely running through open farmland scrub and less mature woodland, whilst the freight line section is enclosed by its position in the Avon Gorge and the blocks of mature woodland that flank the slopes of the site. The current operational uses of these sections also differ, as the freight line is an existing operational route, whilst Portishead to Pill is not used for rail at present.

Portishead to Pill

Designated Sites

9.4.5 Designated nature conservation sites of **International** importance are shown on Figure 9.1 in the ES Volume 3 Book of Figures (DCO Document Reference 6.24). Further descriptions of the designated and non-designated sites are provided in the Extended Phase 1 Habitat Survey in Appendix 9.1 (DCO Document Reference 6.25). The internationally designated sites are described in more detail in the Report to Inform HRA in Appendix 9.12 (DCO Document Reference 5.5). Details of the sites and their distance from the DCO Scheme are presented in Table 9.8. The table give the approximate

distance to the closest point of the land to be acquired permanently and land to be used temporarily. The Order limits at 1:2,500 (A3) are provided in the General Arrangement Plan (DCO Document Reference 2.4).

Table 9.8: European and Ramsar sites within 30 km of Portishead to Pill disused line

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Severn Estuary SAC	Estuaries, mudflats, sandflats, Atlantic salt meadows and fish species.	80 m	30 m
Severn Estuary SPA	Internationally important assemblage of overwintering birds.	80 m	30 m
Severn Estuary Ramsar	Tidal range, estuarine communities, fish, waterfowl.	80 m	30 m
Avon Gorge Woodlands SAC	*Tilio-Acerion* forests of slopes, screes and ravines. Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia*.	2.8 km	3 km
North Somerset and Mendip Bats SAC	*Tilio-Acerion* forests of slopes, screes and ravines. Lesser horseshoe and greater horseshoe bats.	9 km	8.8 km
Chew Valley Lake SPA	Winter populations of shoveler *Anas clypeata*	9 km	9 km
Wye Valley Woodlands SAC	*Tilio-Acerion* forests, *Taxus baccata* woods, *Asperulo-fagetum* forests and lesser horseshoe bats	18.5 km	18.5 km

Table 9.8: European and Ramsar sites within 30 km of Portishead to Pill disused line

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Wye Valley and Forest of Dean Bat Sites SAC	Lesser horseshoe and greater horseshoe bats.	19 km	19 km
Mendip Limestone Grassland SAC	*Tilio-Acerion* forests of slopes, screes and ravines. Greater horseshoe bats.	21 km	21 km
Bath and Bradford on Avon Bats SAC	Lesser horseshoe, greater horseshoe and Bechstein's bats *Myotis bechsteinii*.	22 km	22 km

9.4.6 Three nationally designated sites are located within a 2 km radius of Portishead to Pill disused line as detailed in Table 9.9 and shown on ES Volume 3 Book of Figures, Figure 9.2 (DCO Document Reference 6.24). These are of **National** importance for nature conservation. Details of the sites and their distance from the disused section of the DCO Scheme are presented in Table 9.9.

Table 9.9: Nationally designated sites within 2 km of Portishead to Pill disused line

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to be used temporarily
Severn Estuary SSSI	Important intertidal mudflats, sand banks, rocky platforms and saltmarsh habitats, important populations of waterfowl, invertebrates and migratory fish.	80 m	30 m
Weston Big Wood SSSI	Mixed deciduous ancient woodland.	1.5 km	1.4 km
Horseshoe Bend, Shirehampton SSSI	Saltmarsh and wooded river cliff.	1.3 km	1.3 km

9.4.7 There are no Local Nature Reserves within 0.5 km of the disused section of the DCO Scheme.

9.4.8 There are a number of WS and SNCI sites within 0.5 km of the disused section of the DCO Scheme. The locations of these sites are shown on ES Volume 3 Book of Figures (DCO Document Reference 6.24), Figure 9.3 and details of these sites and their distance from the disused section of the DCO Scheme are given in Table 9.10. The WS and SNCIs are of **County/District** importance for nature conservation.

9.4.9 A botanical survey, including a National Vegetation Classification ("NVC"), of the Field East of Court House WS was undertaken on 7th September 2020. The NVC communities identified at the site were as follows:

- S26c (common reed *Phragmites australis* – nettle *Urtica dioica* tall herb fen; hemlock water-dropwort *Oenanthe crocata* sub-community) occurs across the majority of the site. Common reed, nettle and hemlock water dropwort are constants, but cover of common reed is low in places.
- NVC community S28b (reed canary grass *Phalaris arundinacea* fen; great willowherb *Epilobium hirsutum* – nettle *Urtica dioica* sub-community) is confined to a band along the eastern edge of the field.

  These two communities (S26c and S28b) potentially fall within the NERC Act 2006, Section 41 habitats of principal importance reedbed and/or fen.

Although the NVC communities can be assigned with reasonable confidence there is potential for other marsh and fen communities to be present, particularly within the areas identified as S26c and the OV25 nettle *Urtica dioica* – creeping thistle *Cirsium arvense* tall herb community. Owing to the survey being undertaken late in the summer season, only collapsed dead stems remained of a number of species, in particular the water dropwort, and much of the S26 and OV25 vegetation was also obscured and collapsed under a blanket of hedge bindweed *Calystegia sepium*, such that some key species may have died off completely and/or have been overlooked. From the seed heads inspected, the water dropwort on the site is predominantly hemlock water-dropwort. The previously recorded corky-fruited water dropwort *Oenanthe pimpinelloides* and the Vulnerable tubular water-dropwort *Oenanthe fistulosa* were not recorded, but there is potential for these species to be present.

The botanical survey identified an accumulation of dead plant matter which appears to be leading to a deterioration of the fen habitats, particularly the NVC S26 community with increasing abundance of creeping thistle and a decline in the cover of common reed. This appears to be leading to a shift to a suite of species more akin to OV25 tall herb habitat in places, although a number of wetland indicators such as hemlock water-dropwort, redshank *Persicaria maculosa* and wild angelica *Angelica sylvestris* remain frequent. Bramble *Rubus fruticosus* agg. underscrub is also encroaching from the peripheries.

9.4.10 Priory Farm is an AWT Nature Reserve. Portbury Wharf Nature Reserve was an AWT Nature Reserve from 2010 to 2015, but is now managed by NSDC. These sites are of **County/District** importance for nature conservation.

Table 9.10: Local Wildlife Sites, SNCIs, and Nature Reserves within 0.5 km (ordered by distance from the Portishead to Pill disused line)

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently.	Approximate distance from the closest point of the designated site to the land to be used temporarily
Portbury Wharf Nature Reserve North Somerset Wildlife Site ("NSWS") (AWT Nature Reserve from 2010-2015)	Marshy grassland, open water and associated habitats and species	0 m	0 m

Table 9.10: Local Wildlife Sites, SNCIs, and Nature Reserves within 0.5 km (ordered by distance from the Portishead to Pill disused line)

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently.	Approximate distance from the closest point of the designated site to the land to be used temporarily
Field east of M5 Motorway, Lodway NSWS	Marshy grassland and semi-improved neutral grassland	0 m	0 m
Drove Rhyne and adjacent fields NSWS	Swamp, standing water (ditches), and semi-improved neutral grassland	0 m	0 m
Fields between railway line and A369, Portbury NSWS	Species rich marshy grassland	0 m	0 m
Field east of Court House NSWS	Species rich unimproved neutral grassland	0 m	0 m
Priory Farm (AWT Nature Reserve)	Wetland with reed bed	0 m	0 m
Land adjacent to Severn Estuary SSSI (Portbury) NSWS	Species rich marshy grassland	69 m	27 m
Fields between A369 and M5 Motorway, Portbury NSWS	Species rich marshy grassland. Many breeding sedge warblers and reed warblers.	58 m	40 m
Fields on Caswell Moor NSWS	Swamp, standing water (ditches), and semi-improved neutral grassland	215 m	41 m

Table 9.10: Local Wildlife Sites, SNCIs, and Nature Reserves within 0.5 km (ordered by distance from the Portishead to Pill disused line)

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently.	Approximate distance from the closest point of the designated site to the land to be used temporarily
Fields adjacent to M5 Motorway, Portbury NSWS	Species rich semi-improved neutral grassland	293 m	176 m
Lamplighter's Marsh SNCI	Brackish marshland, saltmarsh influenced grassland and secondary (recent) woodland	416 m	183 m
Lamplighter's Open Space Bristol Wildlife Corridor Site (BWCS)	Amenity parkland with trees	376 m	347 m

Habitats

9.4.11 The following habitats are found along the disused section of the railway between Portishead and Pill (Appendix 9.1, Extended Phase 1 Habitat Survey, DCO Document Reference 6.25).

- **Woodland, trees and scrub** - Mature ash *Fraxinus excelsior* trees and silver birch *Betula pendula* recent (secondary) woodland are present in areas along the disused section of the railway along with small willow *Salix* sp. and alder *Alnus glutinosa* trees. Dense continuous scrub is the dominant habitat with bramble *Rubus fruticosus* agg. and hawthorn *Crataegus monogyna*. These habitats are considered to be of **Regional** importance as they represent a linear corridor for the foraging and movement of bats. The habitat also provides connectivity within the wider landscape such as the network of hedgerows and woodland belts for a variety of species groups including mammals, birds, invertebrates, amphibians and reptiles. A number of trees supporting potential roosting habitat for bats and barn owls is present in the woodland.
  - Other areas of woodland are present outside of the immediate railway corridor. A belt of planted trees and shrubs screens the depot area in Royal Portbury Dock from the Portishead Branch Line. It consists of such species as field maple *Acer campestre*, oak *Quercus robur* with hawthorn and guelder-rose *Viburnum opulus*. Another screening belt of trees has been planted adjacent to the M5

consisting mostly of broadleaf species including ash, Norway maple *Acer platanoides* and oak.

- It should be noted that the vegetation along the railway corridor was partially cleared in 2013, 2015, 2017, 2018 and 2019 to facilitate access to the railway corridor and to permit access for the site investigations to inform the project design. During this clearance a corridor of approximately 10 m wide was cleared. It is estimated that approximately 600 semi-mature trees have been removed from the 10 m wide corridor during these works. The cleared trees were common tree species typical of successional habitat from scrub to woodland, i.e. self-seeded ash, silver birch and willow. Even though trees and scrub have been cleared, the linear corridor is still considered to be of regional importance to horseshoe bats as detailed above.
- **Hedgerows.** None of the hedgerows are considered to be 'Important' under the Hedgerow Regulations 1997 except for one hedgerow at Lodway (Appendix 9.14, Hedgerow Survey DCO Document Reference 6.25), which is considered to be of **Local** importance due to diversity of species.

- **Grassland** - Two areas of semi-improved grassland have been identified within the disused line corridor, one to the west of Quays Avenue in Portishead and one at the far eastern end of the disused line corridor near Pill where patches of bare ground are present and bramble is starting to develop within the sward. Habitats surveyed to the north of the disused line between Portbury Wharf Nature Reserve and Station Road, south of the disused line to the west of Station Road and to the south of the disused line at Lodway are predominantly semi-improved grassland with species including Yorkshire Fog *Holcus lanatus*, common hogweed *Heracleum sphondylium* and red fescue *Festuca rubra.* The grassland areas are considered to be of importance within the **immediate zone of influence only** because these are species poor and ubiquitous.
- **Tall Ruderals** – Areas of tall ruderal vegetation were identified within the disused line. Common nettle *Urtica dioica* is the dominant species, along with broad-leaved dock *Rumex obtusifolius* and rosebay willowherb *Chamerion angustifolium* in areas surrounded by bramble. The tall ruderal areas are considered to be of importance within the **immediate zone of influence** because they are species poor and ubiquitous.
- **Reedbed and Wetlands** - Stands of common reed *Phragmites australis* within the disused line corridor were dry, except reed growing immediately east of Portbury Dock Road, which was associated with a wet ditch. Reed stands were species-poor and generally small in extent and are considered to be of importance within the **immediate zone of influence only.**
- **Watercourses and ponds** - A number of watercourses and drains are present passing beneath the DCO Scheme and draining parallel to the site. In most cases the watercourses were wet at the time of the survey but on subsequent surveys were often dry and are therefore considered to be ephemeral features. Ponds or standing water in ditches within the DCO Scheme are all shallow and shaded features of small extent and

often covered with duckweed *Lemna minor*. There are a number of ponds outside the disused railway line boundary. The watercourses and drains within the DCO Scheme provide a link between other wetlands to the north and south and are considered to be of **Local** importance for nature conservation and are not considered further in this report except where they have been identified as supporting protected species.

- **Structures** - Over-bridges and culverts cross the railway corridor. The over-bridges have the potential to support breeding, roosting and hibernating fauna, such as bats and birds. These structures are therefore considered to be of up to **Local** importance for nature conservation and are not considered further in this report except where they have been identified as supporting protected species.

Plants

9.4.12 Plant species listed on Schedule 8 of the WCA receive protection under Section 13 (1) which prohibits intentional picking, uprooting or destruction of plants.

9.4.13 Section 14 (2) of the WCA prohibits planting or otherwise causing to grow in the wild any plant which is included in Part II of Schedule 9. Species listed on Schedule 9 include Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandulifera*, various cotoneaster species *Cotoneaster* sp. and Virginia creeper *Parthenocissus quinquefolia*.

9.4.14 Numerous records of notable plants have been provided for the search area. The majority of the records are from the designated sites outside of the disused railway line. No notable or Schedule 8 plant species were identified during the Phase 1 habitat survey and the site is considered to be of importance for plants within the **immediate zone of influence only** and is not considered further in this report.

9.4.15 The invasive species Japanese knotweed *Fallopia japonica* was identified within a section of railway east of Quays Avenue in Portishead.

Protected Species

9.4.16 Protected species records from BRERC and ecological surveys confirm the presence of the following species within or in habitat immediately adjacent to the DCO Scheme.

Amphibians

9.4.17 Amphibians are partially protected by the WCA. Great crested newts are fully protected by the WCA and are listed on Schedule 2 of the Habitats Regulations 2017 as a European Protected Species. Great crested newt and common toad *Bufo bufo* are Species of Principal Importance under the NERC Act 2006. Details of surveys for great crested newts and other amphibians are presented in Appendix 9.4 (DCO Document Reference 6.25) and waterbody locations are shown on ES Volume 3 Book of Figures, Figure 9.4 (DCO Document Reference 6.24).

9.4.18 Forty-seven potential waterbodies, including ponds and ditches, have been identified within 250 m of the DCO Scheme.

9.4.19 Following further inspection between 2015 and 2018, nine of the 47 waterbodies were found to be either unsuitable for great crested newts (e.g.

large flowing stream), not found or not accessible. The remaining 38 were subject to Habitat Suitability Index ("HSI") surveys.

9.4.20 Following the results of the HSI surveys, further surveys were undertaken using conventional surveys and environmental DNA ("eDNA") and nine ponds were confirmed as positive for great crested newts (two ponds were assessed using survey data from NSDC). Surveys for population size class estimations were undertaken and the adult peak count was 6 adults, indicating a small population of great crested newts (less than 10 individuals at the peak count).

9.4.21 One pond which was confirmed positive for great crested newts (pond number 28) has since been infilled under licence as part of the Court House Farm development by Bristol Port Company (Planning Application reference 16/P/1987/F). Amphibians trapped from the pond were moved to a receptor site at Shipway.

9.4.22 The disused line and ponds immediately surrounding Portishead are considered to be a key area for great crested newts due to the number of waterbodies with great crested newts present and is therefore of **District** importance for nature conservation.

9.4.23 Table 9.11a details the peak count of common frog, common toad, palmate newts and smooth newts from the pond surveys undertaken in 2015 and 2016.

Table 9.11a Peak count of common frog, common toad, smooth newt and palmate newt from pond surveys

Waterbody Number	Species	Peak Count	Date Range
6	Smooth newt	9	2015-2016
	Toad	1	2015-2016
	Frogspawn	Present	2015
7	Smooth newt	31	2015
7a	Smooth newt	3	2015
	Tadpoles – frog	Present	2015
9	Smooth newt	37	2015
	Tadpoles – frog	Present	2015
	Frogspawn	Present	2015
10	Gravid smooth newt	1	2015
11	No amphibians – dried up	0	2015
12	Too much veg to torch	0	2015
13	Too much veg to torch	0	2015
17	Smooth newt	14	2015
	Toad	2	2015

Table 9.11a Peak count of common frog, common toad, smooth newt and palmate newt from pond surveys

Waterbody Number	Species	Peak Count	Date Range
19	No amphibians	0	2015
21	Smooth newt	10	2015
	Smooth newt eggs	Present	2015
22	Smooth newt	2	2015-2016
23	No amphibians	0	2015
26	Smooth newt	2	2015
28	Smooth newt	28	2016
	Smooth newt eggs	Present	2016
	Palmate newt	1	2016
	Frog	1	2016
	Tadpoles – Frog	Present	2016
	Toad	1	2016
31	No amphibians – dried up	0	
32	Smooth newts	7	2015
	Tadpoles – Frog	Present	2015
	Tadpoles – Toads	Present	2015
37	Smooth newt	1	2016
	Frog	1	2016

9.4.24 Smooth newt *Lissotriton vulgaris* and common frog *Rana temporaria* are widespread across the DCO Scheme footprint. The population present is considered to be of **Local** importance for nature conservation.

9.4.25 Common toad *Bufo bufo* are also widespread across the DCO scheme footprint (Table 9.11b). Two common toad migration routes are known in the vicinity of the DCO Scheme: one east of Portishead and one west of Pill. Records of toads from these migration routes collected by the Portishead and Pill Toad Patrols, obtained from Froglife in 2020, show that between about 500 and 1,000 toads were collected over the migration seasons in six survey years and averaging 670 from roads centred on Fennel Road, Portishead, which is close to Portishead Ecology Park[3]. In ten survey years between 36 and 1766 toads were collected from Pill cycle path, with an average of about 840 toads, excluding the low count in 2010 (see Table 9.11b). Based on these data and the opinion of FrogLife (personal communication, Operations Manager, 30 November 2020), the population is considered to be of **Regional** importance. However, there is high variability

[3] www.froglife.org

in the number of toads collected from Pill cycle path. In addition, Pill Toad Patrol acknowledges that some toads may be counted twice due to the males likely heading back onto the cycle path looking for females after being moved. The results of the survey undertaken by the DCO Scheme in spring 2021 has found a maximum of 38 toads with 2 breeding pairs at the breeding pond. Based on these data the toad population could be assigned less importance (i.e. District importance). These migration routes and the disused line were surveyed during early spring 2021, to record the number of individuals crossing the disused line towards the identified toad breeding pond and at the breeding pond (as shown on the Environmental Masterplan, DCO Document Reference 2.53 and discussed further in Appendix 9.13, DCO Document Reference 6.25).

Table 9.11b FrogLife data of species recorded during toad patrols in Portishead and Pill.

Toad Patrol	Species	Alive Count	Dead Count	Year
Pill	Toad	36	3	2010
	Frog			
	Newt (palmate, smooth or GCN)			
Pill	Toad	490	9	2011
	Frog			
	Newt (palmate, smooth or GCN)			
Pill	Toad	905	16	2012
	Frog	1		
	Newt (palmate, smooth or GCN)	62	5	
Pill	Toad	1766	9	2013
	Frog			
	Newt (palmate, smooth or GCN)	126	4	
Pill	Toad	449	7	2014
	Frog	1		
	Newt (palmate, smooth or GCN)	33		
Portishead	Toad	644		2014
	Frog	822		
	Newt (palmate, smooth or GCN)	155		
Pill	Toad	1270	27	2015
	Frog	4	3	
	Newt (palmate, smooth or GCN)	52	6	

Table 9.11b FrogLife data of species recorded during toad patrols in Portishead and Pill.

Toad Patrol	Species	Alive Count	Dead Count	Year
Pill	Toad	695	18	2016
	Frog	4		
	Newt (palmate or smooth)	39		
Portishead	Toad	525	12	2016
	Frog	774	25	
	GCN	5		
	Newt (palmate or smooth)	111		
Pill	Toad	677		2017
	Frog	12		
	Newt (palmate or smooth)	21		
Portishead	Toad	1015	68	2017
	Frog	782	70	
	GCN	5		
	Newt (Palmate or Smooth)	79	5	
Pill	Toad	282	4	2018
	Frog	2	5	
	GCN	0		
	Newt (palmate or smooth)	32		
Portishead	Toad	546	60	2018
	Frog	308		
	GCN	2		
	Newt (palmate or smooth)	74		
Portishead	Toad	615	55	2019
	Frog	462	6	
	GCN	6	1	
	Newt (palmate or smooth)	31	4	
Pill	Toad	1046	6	2020
	Frog	2		
	Newt (palmate or smooth)	25	3	
Portishead	Toad	679	39	2020
	Frog	500	31	

Table 9.11b FrogLife data of species recorded during toad patrols in Portishead and Pill.

Toad Patrol	Species	Alive Count	Dead Count	Year
	GCN	14	2	
	Newt (palmate or smooth)	155	7	

The alive count is of live amphibians that were helped by the patrols, dead count is the number of remains that were found. Empty cells represent no data, not specifically a zero count.

Badgers

9.4.26 Badgers *Meles meles* and their setts are protected under the Protection of Badgers Act 1992.

9.4.27 The badger survey undertaken in respect of the DCO Scheme is presented as a confidential document at Appendix 9.6 Badger Survey (DCO Document Reference 6.25).

9.4.28 Considering the location of the site and the level of activity within the site and the surrounding area, the site and badger population are considered to be of **Local** importance.

Bats

9.4.29 All bat species and their places of refuge are fully protected by the Habitats Regulations 2017 and the WCA.

9.4.30 A bat survey undertaken in 2011 found a high level of bat activity, with mostly foraging behaviour along the disused section of the Portishead Branch Line DCO Scheme; below bridges at Sheepway and from the Portbury area to Pill. Commuting behaviour was recorded in Portishead, with low levels of foraging and with overall lower numbers of bats than the rest of the railway line.

9.4.31 A further bat survey along the disused section of the DCO Scheme was undertaken from August to October 2014 (Appendix 9.2 Bat Technical Appendix, DCO Document Reference 6.25). The surveys showed that the disused railway line was being used by at least six bat species during late summer and autumn 2014, including the rare lesser horseshoe bats *Rhinolophus hipposideros* and greater horseshoe bats. Bat roost potential is confined to a small number of trees and structures.

9.4.32 Further bat surveys were undertaken along the disused line in 2015-18 (Appendix 9.2, Bat Technical Appendix, DCO Document Reference 6.25). These comprised bat activity transects, automated bat dataloggers, trapping surveys, radio-tracking of two greater horseshoe bats, emergence surveys of structures and climbing and ground inspection surveys of trees. The bat activity surveys confirmed 13 species of bats including lesser horseshoe, greater horseshoe, Leisler's bat *Nyctalus leisleri*, *Myotis* sp. and Nathusius' pipistrelle *Pipistrellus nathusii.*

9.4.33 The disused railway line is a prominent feature within the landscape between Portishead and Pill and provides a link between semi-natural habitats and foraging areas for bats. The importance of the landscape is

recognised in the North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document (North Somerset Council, 2018), which places the disused railway line in Band C of the "Bat Consultation Zone". The rare lesser and greater horseshoe bats regularly occur between Portbury Wharf Nature Reserve and Royal Portbury Dock, and the study confirms that it provides a corridor for movement by bats throughout the activity season. Scrub on the disused railway line provides good quality foraging habitat for bats and studies show scrub is frequently used by greater horseshoe bats (Billington, 2000). Peaks in greater horseshoe activity on the disused railway line in June is consistent with these published study findings. The disused railway line also provides connectivity to greater horseshoe foraging habitats, with the disused railway line linking grazed pasture with hedgerows, semi-natural grassland and woodland, and wetland habitats including riverine habitats of the River Avon.

9.4.34 A radio-tracking study (Appendix 9.2, Bat Technical Appendix, DCO Document Reference 6.25) of one male and one female greater horseshoe bat linked the disused line to Brockley Hall Stables SSSI (approximately 9 km south-west of the DCO Scheme at NGR ST471696), which is part of North Somerset and Mendip Bats SAC. This identified seasonal use of the disused railway line by the North Somerset and Mendip Bats SAC greater horseshoe population and has established that the disused railway line has a function as a SAC bat habitat (within Bat Consultation Zone C).

9.4.35 A development at Court House Farm, Marsh Lane, Easton-in-Gordano (Planning Application reference 16/P/1987/F) for storage of cargo and associated infrastructure has been built to the south of the Portishead to Pill line. The development retained the existing mature poplar trees and a new hedgerow has been planted between the development and the disused railway line. The development has a sensitive lighting strategy to minimise light levels as much as possible and lighting assessment provided in support of the planning application considers the lighting (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 (NSC planning application on line, accessed 07/01/19). Lighting (lux) levels are to be monitored post-construction by the developers in accordance with a planning condition to ensure anticipated lux levels of <0.5 lux are met.

9.4.36 The disused railway line is an integral part of a permeable landscape for lesser and greater horseshoe bats and provides a corridor for movement west of the Avon Gorge Woodlands SAC, a stronghold for these species. It is a core element of a narrowing green gap between Pill and the west of Portbury Dock. It is of consequence to the greater horseshoe bat population of the North Somerset and Mendip Bats SAC, which is of European importance. 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'. 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 echolocation

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. It is considered to be of **Regional** importance as a linear landscape feature for the movement of horseshoe bats.

9.4.37 Four bat roosts were confirmed on the disused railway line, with three small day roosts in two of the bridge structures used by common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus*, and a night roost used by lesser and greater horseshoe bats in a derelict store. The Bat Mitigation Guidelines (Mitchell-Jones, 2004) provide guidance on the conservation significance of bat roosts according to the roost status and this has been used to evaluate the roost resource on a geographical scale in Table 9.12.

Table 9.12: Evaluation of the Bat Roost Resource on the Disused Railway Line

Roost	Conservation Significance	Importance on a Geographical Scale
Common pipistrelle bats in Sheepway bridge	Low – a roost that supports individual bats of common species	**Immediate zone of influence only**
Common pipistrelle bats in Royal Portbury Dock Road bridge	Low **–** a roost that supports individual bats of common species	**Immediate zone of influence only**
Soprano pipistrelle bats in Royal Portbury Dock Road bridge	Low – a roost with a small number of bats of a common species: not a maternity site	**Immediate zone of influence only**
Lesser and greater horseshoe bats in a derelict store near Station Road	Moderate – feeding perches of an Annex 2* species	**Local**

*Species listed on Annex 2 of the Habitats Directive in 1992 (Council Directive 92/43/EEC)

9.4.38 No evidence of roosting bats was found in the trees inspected although four are categorised as providing high potential for roosting bats and seven have moderate potential. The tree roost features are important within the immediate zone of influence and with the potential to support breeding bats, the roost resource is of **Local** importance.

Birds

9.4.39 All breeding birds are protected in the UK under the WCA while actively nesting. Birds listed under Schedule 1 of the WCA are also protected from disturbance while actively nesting.

9.4.40 Numerous bird records have been provided for the search area. These include Red List species (Eaton *et al*., 2015), birds listed on Section 41 of the NERC Act 2006, and species listed on Schedule 1 of the WCA. Many species of wetland bird have been recorded, due to the proximity to the

Severn Estuary, and there are records for ground nesting species, raptors and passerine species.

9.4.41 The Severn Estuary SPA, Ramsar and SSSI is of value at the **international** level for birds as it is a European site. The Severn Estuary SPA 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. It also qualifies under Article 4.2 as a wetland of international importance by regularly supporting in winter over 20,000 waterfowl and by regularly supporting in winter internationally important numbers of the following five species of migratory waterfowl:

- Greater white-fronted goose *Anser albifrons*;
- Shelduck *Tadorna tadorna*;
- Gadwall *Anas strepera*;
- Dunlin *Calidris alpina*; and
- Redshank *Tringa totanus*.

9.4.42 Severn Estuary Ramsar qualifies under the following:

- 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, greater white-fronted goose, common shelduck, gadwall, dunlin and common redshank.
- 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).

9.4.43 The Severn Estuary SSSI is of international importance for wintering and passage wading birds, with total winter populations averaging about 44,000 birds. Numbers can be considerably higher during severe winters when, owing to its mild climate, the Severn supports wader populations that move in from the colder coasts of Britain. The SSSI holds most of the estuary's internationally important curlew *Numenius arquata* and redshank and most of its nationally important ringed plover *Charadrius hiaticula* and grey plover *Pluvialis squatarola* populations. Other waders which occur in significant numbers within the SSSI are common snipe *Gallinago gallinago*, knot *Calidris canutus*, whimbrel *Numenius phaeopus* and turnstone *Arenaria interpres*.

9.4.44 The SSSI is internationally important for dunlin and supports about 7.5% of the British wintering population of this species. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of dunlin in Britain.

9.4.45 In late winter and early spring the SSSI supports nationally important numbers of shelduck, following the partial dispersal from their moulting grounds in Bridgwater Bay. There are also significant numbers of Wigeon *Anas penelope*.

9.4.46 Portbury Wharf Nature Reserve is situated immediately north of the disused line. The grazing marsh areas are important for birds such as snipe and lapwing *Vanellus vanellus*. An ornithological assessment of the nature reserve has been undertaken using bird data provided by AWT from 2011 to 2015 inclusive (Appendix 9.3a Ornithology of Portbury Wharf Nature Reserve, DCO Document Reference 6.25). Many bird species are found at the site, including at least 13 that are Red-listed and 33 that are Amber-listed as Birds of Conservation Concern with numerous waterbirds (i.e. waders, gulls, ducks and geese) as well as notable farmland birds such as skylark *Alauda arvensis*, reed bunting *Emberiza schoeniclus* and barn owl *Tyto alba.* The nature reserve is functionally linked to the Severn Estuary designated site.

9.4.47 Four years of Wetland Bird Survey ("WeBS") bird data were provided by AWT for the reserve, recorded between 2011 to 2015 inclusive. These figures were used to calculate the percentage of the overall SPA/Ramsar qualifying populations of a given species which could be present at a site. These data mainly relate to wintering waterbirds. Breeding lesser black-backed gull is listed within the Severn Estuary Ramsar citation so was also considered.

9.4.48 The SPA/Ramsar qualifying bird species shelduck was present at very low percentages (less than 0.1%) of the cited population size. 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.

9.4.49 Based on the wide range of bird species occurring within the nature reserve the importance of the bird populations are considered to be of **County** importance.

9.4.50 During the 2014 Phase 1 Habitat survey and a breeding bird survey (Mott MacDonald 2011) passerine birds such as blue tit *Cyanistes caeruleus*, blackbird *Turdus merula* and robin *Erithacus rubecula* were present throughout the length of the disused section of the DCO Scheme. Numerous opportunities for nesting and foraging exist within the site in hedgerows, trees and scrub. The passerine bird population is of **Local** importance.

9.4.51 A survey of WCA Schedule 1 bird species barn owl and peregrine falcon *Falco peregrinus* was undertaken in 2017 along the DCO Scheme (Appendix 9.3c Ornithology Survey Report WCA Schedule 1, DCO Document Reference 6.25, which is a confidential document available to appropriate consultees). No positive sightings were made of barn owls during the walkovers of the DCO Scheme study area, although an adult bird was observed on the evening of 25 July 2017 prior to a walkover survey approximately 550 m from the disused section of the railway at Portbury Wharf Nature Reserve. Barn owls can fly over a kilometre during foraging and it is likely that this bird uses the rail corridor, given its foraging opportunities.

9.4.52 During the walkovers nine potential barn owl roosting/nesting locations were identified, and the desk study revealed one known location of barn owl breeding activity (Portbury Wharf Nature Reserve) and one nearby barn owl

roosting location (a veteran oak tree in the Portbury Dock Road Bridge area). Another barn owl roost was found in 2018 in the Lodway area.

9.4.53 The barn owl features were all within the section from Portishead to the start of the Avon Gorge, where there is suitable foraging habitat (rough meadow and grassland) in good quantities nearby in addition to the potential roost/nest features. It is considered that the barn owl population is of **Local** importance. The peregrine survey is discussed in paragraph 9.4.135.

Dormice

9.4.54 The hazel dormouse *Muscardinus avellanarius* is listed under Schedule 5 of the WCA and is fully protected under Section 9 of the Act and Schedule 2 of Habitats Regulations 2017.

9.4.55 There is one uncertain record of 'maybe a dormouse' from 2009, 600 m south of the site at Portbury Common (BRERC, 2014). Dormice have been recorded with dispersal distances of over 1 km so they could use the disused rail corridor if suitable habitat is present. This record is not confirmed and there are no other records of dormice in the biological records search. Discussions in 2018 with NSDC staff confirmed there are no records of dormice at Portbury Wharf Nature Reserve.

9.4.56 Dormice presence was discounted from the disused rail corridor (Appendix 9.1, Extended Phase 1 Habitat Survey, DCO Document Reference 6.25) due to limited habitat quality and the lack of a suitable woodland connection to the rail corridor. Large blocks of woodland suitable for dormice are located south of the M5, which is considered a barrier to dormouse dispersal. If dormice are present (which is in doubt due to only one unverified biological record), the rail corridor habitat is not optimum and it is therefore considered to be of importance within the **immediate zone of influence only.**

Reptiles

9.4.57 Widespread reptiles receive a limited degree of protection in the UK under the WCA. Reptiles likely to use the site (e.g. grass snake *Natrix natrix* and slow worm *Anguis fragilis*) are protected against killing, injury and sale.

9.4.58 A reptile survey was undertaken by Mott Macdonald (2011). A single juvenile grass snake was found at the western end of the site and a low population of slow worms was recorded along the length of the disused railway.

9.4.59 A second reptile survey was undertaken of the disused line between April and June 2015 (Appendix 9.5 Reptile Survey Report, DCO Document Reference 6.25). Slow worms and grass snakes have been recorded along the entire length. The entire survey area provides good habitat for reptiles with particular strongholds between the edge of the urban area of Portishead and 0.5 km west of Portbury Dock Road. The survey findings suggest that there is a medium to large population of slow worms and grass snakes present along the disused line.

9.4.60 The vegetation structure and connectivity of the site provides excellent reptile habitat. Key components of the site include south facing banks, variable structure, good connectivity and lack of disturbance. Reptiles were found within areas of grass, tall ruderal, bramble and occasionally within

sparsely vegetated sections of ballast. Potential reptile hibernacula such as wooden sleepers and dead wood habitats are also frequent along the disused railway line.

9.4.61 Considering the size of the reptile population, the study area is considered to be of **District** importance for nature conservation.

European eel

9.4.62 In their response to consultation, the Environment Agency states that there are records of European eel *Anguila anguila* in the vicinity of the DCO Scheme. This species occurs in watercourses and marshes of the low-lying coastal plains. The European eel is classified as critically endangered on the International Union for Conservation of Nature ("IUCN") Red List. There are a number of watercourses and drains passing beneath the DCO Scheme and draining parallel to the site. In most cases the watercourses are considered to be ephemeral features and are unlikely to be of value to eels and are considered to be of importance within the **immediate zone of influence only.** No eel surveys have been undertaken. However, consideration has been given to protecting watercourses potentially supporting eels in the Master Construction Environmental Management Plan (CEMP) included in Appendix 4.2 (DCO Document Reference 8.14).

Invertebrates

9.4.63 A number of invertebrate species receive different levels of protection under various pieces of legislation. Some species are listed on Schedule 5 of the WCA and therefore protected under Section 9 of the Act. In addition, almost 400 invertebrate species, some of which are also Schedule 5 and EPS, are listed under Section 41 of the NERC Act, and form the Species of Principal Importance in England list as a Government priority for conservation action.

9.4.64 An invertebrate survey of the disused section of the DCO Scheme was conducted in 2011 (Mott MacDonald 2011) and five Nationally Scarce invertebrate species were recorded. Of these, only one (a parasitoid fly *Athrycia curvinervis*) is considered important, although it is thought that this species is under-recorded. Small areas of rough grassland and tall ruderal vegetation in Portishead and between Marsh Lane and Pill were considered to be of value to invertebrates. The areas of dense scrub have no significant conservation importance for invertebrates.

9.4.65 Numerous invertebrate records have been provided for the search area (BRERC, 2014), including records for notable beetles, dragonfly and other odonata, grasshoppers and crickets, butterflies and moths, many of which are listed on Schedule 5 of the WCA 1981 (and protected under Section 9 (5); sale only) and Section 41 of the NERC Act. The majority of the records are from the designated sites outside the disused railway line.

9.4.66 Further survey of the rough grassland and tall ruderal vegetation identified as having invertebrate value has not been undertaken because the small areas will not be substantially damaged by the DCO Scheme. The site is considered to be of **Local** importance for invertebrate species and invertebrates are not considered further in this report.

Otter

9.4.67 Otters are a European protected species ("EPS") and are also listed under Schedule 5 of the WCA and fully protected under section 9 of the WCA. This protection makes it an offence to kill, disturb or injure otters, damage or destroy a breeding or resting place or obstruct access to their resting or sheltering places without a licence.

9.4.68 Otters are present at Portbury Wharf Nature Reserve[4]. The waterbodies near Portbury Wharf Nature Reserve, the fishing lake at Station Road and the habitat to the east of the M5 at Pill were assessed for suitability for otters and surveyed for otter signs in October 2015. Otter signs were identified on the Portbury Drain, Portishead during a water vole survey undertaken in April 2018 (Appendix 9.8 Otter Survey Report, DCO Document Reference 6.25). The area to the east of the M5 near Pill is good otter habitat due to lack of disturbance, dense vegetation and links via the saltmarsh to the River Avon. A mammal pathway and possible otter lying up site were found in this area.

9.4.69 Due to the presence of otters in several places, the study area is considered to be of **District** importance to otters.

Water vole

9.4.70 Water voles and their places of shelter receive full protection under the provisions of Section 9 of the WCA. A population of water vole was recorded in 2007 in Drove Rhyne approximately 0.75 km to the north of the disused section of the DCO Scheme. This species has also been reintroduced to Portbury Wharf Nature Reserve, which extends immediately north of the disused line.

9.4.71 Sixteen waterbodies were surveyed for habitat suitability and water vole signs in June 2015 and eight which were suitable for water voles were re-surveyed in 2018 (Appendix 9.9 Water Vole Survey, DCO Document Reference 6.25). Five water bodies were considered to provide suitable habitat for water voles and three water bodies may provide 'sink habitat' for dispersing water voles. No confirmed evidence of water vole presence was found during the survey in June 2015 or in 2018. However, potential burrows and footprints were recorded along waterbody WV1 (Portbury Drain, Portishead; Figure 9.4 Volume 3, Book of Figures, DCO Document Reference 6.24) during the April 2018 survey visit. In addition, two ponds have been identified where water voles are present. One pond has since been infilled at Court House Farm as part of the development of the site by Bristol Port Company and the other pond is greater than 5 m from the DCO Scheme and will therefore not be impacted by the works. The site is considered to be of **Local** importance for water voles.

Summary

9.4.72 A summary of valuation and likelihood of significant effects (requiring detailed assessment) on all the habitat and species detailed in this section is presented in Table 9.13.

[4] www.avonwildlifetrust.org.uk

Table 9.13: Summary of Importance and Likelihood of Significant Effects (requiring detailed assessment) on ecological features Portishead to Pill.

Feature	Nature Conservation Protection	Importance of Feature	Potential for Effect	Subject to detailed assessment
10 SAC/SPA or Ramsar sites	Habitats Regulations	International	Construction and operational disturbance	Yes, due to importance of feature
3 SSSIs	WCA 1981 (as amended)	National	Construction and operational disturbance	Yes, due to importance of feature
Portbury Wharf Nature Reserve and Priory Farm Nature Reserve	NSC Core Strategy Policy CS4	County /District	Habitat loss and disturbance, Operational disturbance.	Yes, due to importance of feature
10 Wildlife Sites or SNCIs	NSC Core Strategy Policy CS4	County /District	Habitat loss and disturbance, operational disturbance.	Yes, due to importance of feature
Trees and Woodland	NSC Core Strategy Policy CS4	Regional	Loss of habitat.	Yes, due to importance of feature
Hedgerow at Lodway	Hedgerow Regulations	Local	Loss of habitat	Yes, due to legal protection
Grassland	None	Zone of influence	Loss of habitat	No, feature below threshold for detailed assessment
Tall ruderal	None	Zone of influence	Loss of habitat	No, feature below threshold for detailed assessment
Reedbed / wetland	None	Zone of influence	Loss of habitat	No, feature below threshold for detailed assessment

Table 9.13: Summary of Importance and Likelihood of Significant Effects (requiring detailed assessment) on ecological features Portishead to Pill.

Feature	Nature Conservation Protection	Importance of Feature	Potential for Effect	Subject to detailed assessment
Watercourses / ponds	None	Local	Loss of habitat	No, feature below threshold for detailed assessment
Structures	None	Local	Construction and operational disturbance	No, feature below threshold for detailed assessment
Plants	Some under WCA	No WCA species. Zone of influence	Loss of habitat	No, feature below threshold for detailed assessment
Great Crested Newts	WCA, Habitats Regulations	District	Potential to kill or injure GCN, loss of habitat, operational disturbance	Yes, due to legal protection
Common toad	WCA, NERC Section 41 species	Regional (possibly District)	Potential to kill or injure, loss of habitat, operational disturbance	Yes, due to legal protection and importance of feature
Other amphibians	WCA	Local	Potential to kill or injure, loss of habitat, operational disturbance	Yes, due to legal protection
Badgers	The Protection of Badgers Act 1992	Local	Loss of habitat, disturbance and harm	Yes, due to legal protection
Bats – roosts (structures and trees)	WCA, Habitats Regulations	Local/Zone of influence	Loss of habitat, disturbance	Yes, due to legal protection

Table 9.13: Summary of Importance and Likelihood of Significant Effects (requiring detailed assessment) on ecological features Portishead to Pill.

Feature	Nature Conservation Protection	Importance of Feature	Potential for Effect	Subject to detailed assessment
Bats – commuting corridor for horseshoe bats		Regional	Loss of habitat	Yes, due to importance of feature
Nesting birds – railway habitat and Portbury Wharf NR	WCA	Local and County	Loss of habitat, disturbance	Yes, due to legal protection
Barn Owl	WCA, Habitats Regulations	Local	Loss of habitat, disturbance	Yes, due to legal protection
Dormice	WCA, Habitats Regulations	Zone of influence	None (likely absence of dormice)	No
Reptiles	WCA	District	Loss of habitat	Yes, due to importance of feature
European Eel	IUCN Red list	Zone of influence	Disturbance during construction	No, except in CEMP
Invertebrates	1 Nationally Scarce	Local	Enhancement by opening up dense scrub	No, feature below threshold for detailed assessment
Otter	WCA, Habitats Regulations	District	Disturbance	Yes, due to importance of feature and legal protection
Water vole	WCA	Local	Possible water vole signs in one waterbody (WV1, Portbury Drain, Portishead)	Yes, due to legal protection

Portbury Freight Line

Designated Sites

9.4.73 Designated sites are shown on Figures 9.1 and 9.2 in the ES Volume 3 Book of Figures (DCO Document Reference 6.24). Further descriptions of the designated and non-designated sites are provided in the Extended Phase 1 Habitat Survey Report in Appendix 9.1 (DCO Document Reference 6.25). European and Ramsar sites are described in more detail in the Report to Inform HRA in Appendix 9.12 (DCO Document Reference 5.5). However, the Avon Gorge Woodlands SAC is described in this section due to the DCO Scheme directly affecting this site (Section 9.6). Details of the sites of **International** importance and their distance from the DCO Scheme are presented in Table 9.14. The tables give the approximate distance to the closest point of the land to be acquired permanently and land to be used temporarily. The Order limits are shown in the General Arrangement Plans at 1:2,500 (A3) (DCO Document Reference 2.4).

Table 9.14: European and Ramsar sites within 30 km

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Avon Gorge Woodlands SAC	*Tilio-Acerion* forests of slopes, screes and ravines. Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia*.	0 m	0 m
Severn Estuary SAC	Estuaries, mudflats, sandflats, Atlantic salt meadows and fish species.	80 m	30 m
Severn Estuary SPA	Internationally important assemblage of overwintering birds.	80 m	30 m
Severn Estuary Ramsar	Tidal range, estuarine communities, fish, waterfowl.	80 m	30 m
Chew Valley Lake SPA	Winter populations of shoveler *Anas clypeata*	9 km	9 km
North Somerset and Mendip bats SAC	Lesser horseshoe, greater horseshoe and Bechstein's bats.	12.5 km	11 km
Wye Valley Woodlands SAC	*Tilio-Acerion* forests, *Taxus baccata* woods, *Asperulo-fagetum* forests and lesser horseshoe bats	18.5 km	18.5 km
Wye Valley and Forest of Dean Bat Sites SAC	Lesser horseshoe and greater horseshoe bats.	19 km	19 km

Table 9.14: European and Ramsar sites within 30 km

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Mendip Limestone Grassland SAC	*Tilio-Acerion* forests of slopes, screes and ravines. Greater horseshoe bats.	21 km	21 km
Bath and Bradford on Avon bats SAC	Greater Horseshoe and Bechstein's bats	21.5 km	21 km
Mells Valley SAC	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) Greater horseshoe bats	24 km	24 km

9.4.74 Five nationally designated sites and four sites listed in the AWI are located within a 2 km radius of the Portbury Freight Line as detailed in Table 9.15. Ancient Woodland sites are shown on Figure 9.3 in Volume 3 Book of Figures (DCO Document Reference 6.24). These are of **National** importance for nature conservation.

Table 9.15: Nationally designated sites and Ancient Woodland sites within 2 km

Designated site or Ancient Woodland site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Avon Gorge SSSI	Boundary within Avon Gorge SAC	0 m	0 m
Leigh Woods NNR	Boundary within Avon Gorge SAC, SSSI	0 m	0 m
Leigh Woods/Oak Wood Ancient Woodland	Boundary within Avon Gorge SSSI	0 m	0 m
Rownham Wood Ancient Woodland	Boundary within Avon Gorge SSSI	0 m	0 m
Severn Estuary SSSI	Important intertidal mudflats, sand banks, rocky platforms and saltmarsh habitats, important populations of waterfowl, invertebrates and migratory fish	80 m	30 m
Ashton Court SSSI	Diverse and nationally scarce saproxylic invertebrate fauna and ancient trees	70 m	50 m
Clifton Down Wood Ancient Woodland (on the other side of the River Avon compared to the DCO Scheme)	Ancient and semi-natural woodland	150 m	150 m

Table 9.15: Nationally designated sites and Ancient Woodland sites within 2 km

Designated site or Ancient Woodland site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Leigh Wood/Markham Bottom Ancient Woodland	Ancient and semi-natural woodland	185 m	185 m
Horseshoe Bend Shirehampton SSSI (on the other side of the River Avon compared to the DCO Scheme)	Saltmarsh and wooded river cliff	650 m	650 m

9.4.75 There are no Local Nature Reserves within 0.5 km of the DCO Scheme.

9.4.76 There are 29 Wildlife Sites ("WS") and ten Sites of Nature Conservation Importance ("SNCI") (non-statutory designated sites within North Somerset and the City of Bristol) within 0.5 km of the DCO Scheme. The locations of these sites are shown on Volume 3 Book of Figures (DCO Document Reference 6.24) Figure 9.3 and details of these sites and their distance from the DCO Scheme are given in Table 9.16. The WS and SNCIs are of **District/County** importance for nature conservation.

Table 9.16: Wildlife Sites and SNCIs within 0.5 km of the DCO Scheme (ordered by distance from the Portbury Freight Line)

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Bower Ashton Playing Fields BWCS	Amenity grassland	0 m	0 m
River Avon (part of) NSWS	Saltmarsh and saltmarsh influenced grassland	0 m	0 m
River Avon (part of) SNCI	Saltmarsh habitats	0 m	0 m

Table 9.16: Wildlife Sites and SNCIs within 0.5 km of the DCO Scheme (ordered by distance from the Portbury Freight Line)

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Avon Gorge and Leigh Woods NSWS	Extremely diverse area including endemic species	0 m	0 m
Bower Ashton Allotments BWCS	Allotments	0 m	0 m
Land between railway line and the River Avon BWCS	Allotments and amenity grassland with trees	0 m	0 m
White City Allotments BWCS	Allotments	0 m	0 m
Alderman Moore Allotments BWCS	Allotments and scrub	0 m	0 m
Bower Ashton Line BWCS	Linear scrub and hedgerow habitat	0 m	0 m
Railway line near Bedminster Down BWCS	Linear scrub and hedgerow habitats	0 m	0 m
Bower Ashton Mineral Railway (disused) SNCI	Scrub, ruderal communities and grassland	1 m	1 m
Parson Street station BWCS	Linear scrub and hedgerow habitat	16 m	16 m
Ashton Court Estate SNCI	A mosaic of habitats including ancient trees and areas of diverse grassland	20 m	20 m
Bedminster Down Allotments BWCS	Allotments	29 m	29 m

Table 9.16: Wildlife Sites and SNCIs within 0.5 km of the DCO Scheme (ordered by distance from the Portbury Freight Line)

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Lamplighter's Marsh SNCI	Brackish marshland, saltmarsh influenced grassland and secondary (recent) woodland	52 m	52 m
Ashton Court Estate NSWS	Ancient trees and areas of diverse grassland	61 m	61 m
Ilchester Crescent Open Space BWCS	Amenity parkland with trees	65 m	65 m
Avon Gorge SNCI	Extremely diverse area including endemic species	82 m	82 m
Land between Hotwell Road and Sion Hill BWCS	Deciduous woodland	95 m	92 m
Cumberland Basin Lock BWCS	Canal lock	124 m	120 m
Kennel Lodge Road Allotments BWCS	Allotments	141 m	55 m
Land between Sneyd Park and the Portway BWCS	Semi improved grassland	170 m	160 m
Signal Station Allotments and Harbour Wall BWCS	Allotments with trees	190 m	190 m
Sneyd Park SNCI	Grazed unimproved and semi-improved species rich grassland	200 m	200 m

Table 9.16: Wildlife Sites and SNCIs within 0.5 km of the DCO Scheme (ordered by distance from the Portbury Freight Line)

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Colliter's Brook SNCI	Semi improved calcareous grassland, hedgerows and scrubby woodland.	220 m	135 m
Clifton and Durdham Downs SNCI	Unimproved and semi-improved calcareous grasslands	200 m	200 m
Land between Windsor Place and The Paragon BWCS	Deciduous woodland	220 m	215 m
Cumberland Basin BWCS	Canal with some trees beside	221 m	217 m
Butterfly Junction BWCS	Trees and scrub	270 m	270 m
River Trym confluence with River Avon BWCS	Tidal mudflats and saltmarsh	280 m	280 m
Manor Farm Sports Ground and Playing Fields BWCS	Amenity grassland bordered by saltmarsh	299 m	300 m
Malago Valley SNCI	Mosaic of scrub, deciduous woodland and semi-improved grassland	295 m	294 m
Cornwallis Gardens BWCS	Deciduous woodland	332 m	332 m
Enterprise Allotments BWCS	Allotments	336 m	336 m

Table 9.16: Wildlife Sites and SNCIs within 0.5 km of the DCO Scheme (ordered by distance from the Portbury Freight Line)

Designated site	Ecological features	Approximate distance from the closest point of the designated site to the land to be acquired permanently	Approximate distance from the closest point of the designated site to the land to be used temporarily
Ashton Park School Playing fields BWCS	Amenity grassland bordered by trees	344 m	344 m
Land north of Ashton Vale fields BWCS	Semi improved grassland	360 m	360 m
Lamplighter's Open Space BWCS	Amenity parkland with tress	365 m	365 m
City and Port of Bristol Sports Ground BWCS	Amenity grassland with trees bordered by saltmarsh	389 m	389 m
Trym Valley SNCI	River and semi-natural broadleaf woodland	414 m	414 m

Habitats

9.4.77 The following habitats are present along the Portbury Freight line between Pill and Ashton Junction.

Avon Gorge Woodlands SAC Habitats

9.4.78 A survey of habitats and flora has been undertaken for the Avon Gorge Woodlands SAC (Appendix 9.10, Flora Survey: Avon Gorge Woodlands SAC/Avon Gorge SSSI, DCO Document Reference 6.25). The Avon Gorge Woodlands SAC is designated for two habitat types, the semi-natural dry grasslands and scrubland faces on calcareous substrates *Festuco-Brometalia* and the *Tilio-Acerion* forests of slopes, screes and ravines. SAC habitats within NR ownership within 3 m of the running rail and the area vertically above this are managed in line with procedures set out in NR's SMS and Vegetation Management Plan ("VMP") (Appendix 9.15, DCO Document Reference 6.25).

***Festuco-Brometalia* dry grasslands**

9.4.79 The *Festuco-Brometalia* grassland is a qualifying feature of the SAC and comprises NVC types CG1 *Festuca ovina-Carlina vulgaris* grassland, CG2 *Festuca ovina-Avenula pratensis* grassland and CG3 *Bromus erectus* grassland. In accordance with the SAC designation these grasslands are regarded to be of **International** importance to nature conservation.

9.4.80 The cliff ledges, some of which support calcareous grassland, are cited in the SAC designation as supporting a high number of uncommon species, such as Bristol rock-cress *Arabis scabra*. The NVC type for these is OV39 *Asplenium trichomanes - A. ruta-muraria* community.

9.4.81 These communities are present on the tunnel portals and associated rock faces immediately south of Clifton Bridge No. 1 Tunnel and tunnel portals and associated rock faces immediately north of Clifton Bridge No. 2 Tunnel. In both cases these include cliffs and ledges within the railway boundary and grasslands on the associated River Avon Tow Path. Both areas are of key importance for maintaining the interest of the SSSI/SAC.

9.4.82 There are also small areas of grassland scattered along the River Avon Tow Path (some of which is owned by NR) which are also mostly being colonised by scrub species such as dogwood *Cornus sanguinea* as well as ivy *Hedera helix*, though occasional patches remain with rare plants such as spring cinquefoil *Potentilla tabernaemontani*.

South of Clifton Bridge No. 1 Tunnel

9.4.83 At Clifton Bridge No. 1 Tunnel, there is a very diverse important area on the 'ramp' (an area of southwest 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*, dogwood and non-native Cotoneaster species. The WCA 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*.

9.4.84 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.

9.4.85 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.*

North of Clifton Bridge No. 2 Tunnel

9.4.86 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*.

9.4.87 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.

9.4.88 On the east side of the River Avon Tow Path on NR land is a narrow strip of CG3 *Bromus erectus* grassland which supports spring cinquefoil and field garlic *Allium oleraceum*.

9.4.89 Quarry Underbridge No. 2 site compound has an area of unimproved calcareous grassland, which is dominated by glaucous sedge *Carex flacca*, has relatively few grasses and a good range of calcicolous grassland herbaceous species including large numbers of common spotted-orchid *Dactylorhiza fuchsii* as well as fairy flax *Linum catharticum*, rough hawkbit *Leontodon hispidus* and marjoram *Origanum vulgare*. The NVC of the grassland is CG2 *Festuca ovina-Avenula pratensis* which conforms to the SAC qualifying grassland *Festuco-Brometalia*.

***Tilio-Acerion* forests**

9.4.90 *Tilio-Acerion* forests of slopes, screes and ravines is a qualifying feature of the SAC, comprising the NVC type W8 *Fraxinus - Acer - Mercurialis* woodland. The *Tilio-Acerion* forests are broadly defined as being mixed forests comprising ash, beech, small-leaved lime *Tilia cordata* and wych elm *Ulmus glabra* on slopes of coarse screes, rocky slopes or colluvions comprising calcareous or siliceous substrates.

9.4.91 The semi-natural ancient woodland canopy of the Avon Gorge is dominated by small-leaved lime with beech, ash and wych elm, with yew *Taxus baccata* associated with the more natural slopes, rocky outcrops and cliffs. Much of this is diverse ancient 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 (Down line Pill portal), and small widths are included in the NR land bordering the railway. Other than small areas on the steepest slopes and cliffs, it has been extensively managed.

9.4.92 Some woodland areas have probably been heavily managed in the past and have been replanted with a canopy of beech and ash, and sometimes non-native species such as sweet chestnut *Castanea sativa*.

9.4.93 The ancient broad-leaved woodland within the SAC falls within the definition of the Annex I habitat *Tilio-Acerion* forests of slopes, screes and ravines and is of **International** importance.

Secondary (Recent) woodland

9.4.94 Woods which developed on previously open ground from the start of the 17th century are termed secondary or recent woodland[5].

9.4.95 The Portishead Branch Line was closed to passengers in 1964 and to all traffic in 1981. Historic photographs show that many habitats were much more open than today, especially the quarries, railway sides and the River Avon Tow Path. Photographs of the Avon Gorge near Clifton Bridge Tunnel No. 2 taken in 1937 show the land between the railway and the River Avon

[5] www.woodlands.co.uk/owning-a-wood/managing-your-woodland-for-wildlife/03-chapter-1---identifying-woodland-types.pdf, (accessed 20.05.19).

Tow Path were predominantly clear of trees[6]. Following closure of the railway and cessation of quarrying activities and lack of vegetation maintenance, the open, rocky cuttings through the Avon Gorge would have provided ideal colonisation sites for many trees and shrubs, including whitebeams, and much is now tall secondary (recent) woodland.

9.4.96 Secondary (recent) woodland (taller than 5 m) is the main woodland type along the railway cuttings, in quarries, between the railway and the River Avon Tow Path, and between the River Avon Tow Path and the river, with small-leaved lime, oak, ash, English elm, wych elm, hazel, hawthorn, Traveller's joy, bramble and invasive non-native species such as holm oak, sycamore and Norway maple. The more open woodland areas are a key habitat for some of the rare whitebeams.

9.4.97 The secondary (recent) woodland often has an abundance of non-native species, but incorporates some floristic features characteristic of the adjacent Annex I habitat and serves as a valuable buffer, in addition to providing connectivity to the wider landscape.

9.4.98 The secondary (recent) woodland is considered to qualify as *Tilio-Acerion* forest and therefore has **International** importance as part of the SAC as well as connectivity to the wider landscape for ancient woodland habitats.

Scrub

9.4.99 Scrub (mainly NVC types W21d *Crataegus-Hedera* and W24 *Rubus* scrub) is not a qualifying habitat of the SAC, but is cited in the designation as important for the species-rich transitions to scrub and herb-rich calcareous grasslands. However, scrub is often encroaching on more valuable grassland habitats.

9.4.100 The discontinuous scrub layer within the woodlands is part of the Avon Gorge SSSI citation and is considered to have **National** importance except where it is encroaching on more valuable grassland habitats.

Other Habitats

9.4.101 Scrub in other areas of the Portbury Freight line comprises scattered and dense scrub dominated by bramble, hawthorn with sections of blackthorn *Prunus spinose*, willow and butterfly-bush *Buddleja davidii* were identified, particularly in the urban areas. Outside of the Avon Gorge it is considered to have importance within the **Immediate zone of influence only** and are not considered further in this report.

9.4.102 Introduced scrub - Small areas of butterfly bush are present adjacent to the River Avon Tow Path between the Portbury Freight Line and River Avon. Cotoneaster is occasional on rock exposures and cherry laurel is occasional in woodland and scrub habitats and both are considered as invasive species within the SAC/SSSI. Introduced scrub is of importance within the **immediate zone of influence only** and are not considered further in this report**.**

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

9.4.103 Tall ruderals - There are some dense patches of common nettle, along with broad-leaved dock *Rumex obtusifolius,* rosebay willowherb and cleavers in areas surrounded by bramble. The tall ruderal areas are considered to be of importance within the **immediate zone of influence only** and are not considered further in this report.

9.4.104 Ephemeral/short perennial - Sections of railway ballast along the track are distinctly species-rich and include species such as bristly ox-tongue *Helminthotheca echioides*, clover *Trifolium repens*, purslane *Claytonia sibirica,* germander speedwell *Veronica chamaedrys,* herb Robert *Geranium robertianum*, barren strawberry *Potentilla sterilis* and wood sedge *Carex sylvatica.* The edges of the ballast provide a significant habitat for the nationally scarce Narrow-leaved bittercress *Cardamine impatiens* and nationally uncommon Pale St John's-wort *Hypericum montanum* (further details are provided in Table 9.17). Where these species are present, the ephemeral/short perennial habitat is considered to be of **National** importance. Elsewhere, the habitat is considered to be of importance within the **immediate zone of influence only.**

9.4.105 Watercourses - The River Avon runs parallel to the railway for much of its length. A number of ditches and streams run parallel and underneath the site. The River Avon is designated as a SNCI and is therefore considered to be of **County/District** importance for nature conservation.

9.4.106 Ponds - Two ponds lie approximately 50 m north and south of the DCO Scheme near Ham Green. These are considered to be of **Local** importance for nature conservation. A further pond is also present in Leigh Woods, see Amphibian section.

9.4.107 Structures - There are four tunnels along this section of railway, which are described in Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7). A number of over-bridges, under-passes and viaducts run across and under the site and there is one derelict building close to the DCO Scheme near Ashton Gate. The structures have the potential to support breeding, roosting and hibernating fauna, such as bats and birds and the faces of some of the tunnel portals are within the Avon Gorge SAC and support internationally rare flora, including *Tilio-Acerion* forests of slopes, screes and ravines and are therefore considered to be of **International** importance for nature conservation.

Protected and Notable Species

9.4.108 Protected and notable species records from BRERC and ecological surveys have confirmed the presence of the following species within or in habitat immediately adjacent to the DCO Scheme. As the legal protection for a number of protected species has been illustrated in earlier sections of this document it will only be referenced in subsequent sections if a species or habitat is novel to this section of the route.

Notable Plant Species

9.4.109 Plant species listed on Schedule 8 of the WCA receive protection under Section 13. Three of these species, round-headed leek *Allium sphaerocephalon*, Bristol rock-cress and spiked speedwell *Veronica spicata* are known to occur in the Avon Gorge. Section 13 of the WCA makes it an offence to:

- intentionally pick, uproot or destroy (Section 13 1a);
- sell, offer for sale, possess or transport for the purpose of sale (live or dead, part or derivative) (Section 13 2a);
- advertise (any of these) for buying or selling (Section 13 2b).

9.4.110 There are many notable plant species within the Avon Gorge. There are approximately 30 Nationally Rare and Nationally Scarce vascular plant species, at least seven of which are rare whitebeams including Avon whitebeam *Sorbus avonensis*, Bristol whitebeam *S. bristoliensis*, Leigh Woods whitebeam *S. leighensis*, Houston's whitebeam *S. x houstoniae*, White's whitebeam *S. whiteana* and Wilmott's whitebeam *S. wilmottiana* all of which are endemic to the Avon Gorge. The notable plant species are described in Table 9.17 and further described in the Flora Survey: Avon Gorge Woodlands SAC / Avon Gorge SSSI (Appendix 9.10, DCO Document Reference 6.25).

Table 9.17: Notable and Important Plant Species

Species	Status[7]	Importance	Location
Field Garlic, *Allium oleraceum*	Nationally Uncommon	County/District	In the Avon Gorge it is known at four sites on the Bristol side, but on the Somerset side it is known only by the River Avon Tow Path south of the Blockhouse slope, and opposite Quarry Bridge No. 1.
Compact Brome, *Anisantha madritensis*	Data deficient		Within the Avon Gorge this annual grass is scattered throughout and varies in abundance from year to year. On the Somerset side, it is restricted to very small populations on the river bank near Clifton Bridge No. 2 Tunnel, Quarries 1, 2 and 4, and the railway. On the railway line it occurs by Clifton Bridge No. 1 Tunnel (Bristol side) and on Miles Dock Bridge.
Bristol Rockcress, *Arabis scabra*	Schedule 8 WCA	National	This species only occurs as a native in Britain in the Avon Gorge, its most northerly site in the world - a long distance from its nearest sites in the mountains of southern Europe. It is a short-lived perennial whose populations can vary from year to year and which spreads around within suitable areas of habitat. Throughout the Avon Gorge, Bristol rock-cress is showing a steady decline, the reasons for which are not fully understood, and any existing populations need careful management. On the Somerset side it is very restricted to the area between Clifton Bridge No. 2 Tunnel and Quarry 2, with a small population recently discovered in Quarry 4. On the railway it occurs on the rocks around the northern (Pill) portal of Clifton Bridge No. 2 Tunnel (5 plants have been recorded on 4 separate ledges), and on the rocks and grassland adjacent to the River Avon Tow Path. It has occurred sporadically on the trackside cliff adjacent to Quarry 1 behind the safety fence. In 2018 the survey found an exceptional colony in Quarry 2 high on the quarry rocks re-establishing itself after clearance of invasive cotoneaster.

[7] See Appendix 9.10 for definitions of Status

Table 9.17: Notable and Important Plant Species

Species	Status[7]	Importance	Location
Narrow-leaved Bittercress, *Cardamine impatiens*	Nationally Scarce	National	The Avon Gorge has one of the largest populations in Britain and is an important site for it but surprisingly it only occurs on the Somerset side and is absent from the Bristol side. On the railway it is locally frequent and occurs south of Clifton Bridge No. 2 Tunnel, south of Quarry 3, and from Miles Dock Bridge northwards. There are occasional patches on the River Avon Tow Path, but none are currently known on NR land. The immediate track sides were sprayed with herbicide in May 2017 and no plants could be seen.
Fingered Sedge, *Carex digitata*	Nationally Scarce	National	It only occurs in the Gully on the Bristol side of the gorge but is scattered along the Somerset side from Nightingale Valley to Quarry 5. On the railway line it occurs on rocks at the Clifton Bridge No. 2 Tunnel, north (Pill) portal, and on and above the cutting cliff by Quarry 3. There is a very good colony on the lower scree slopes in Quarry 2 which has benefitted from management of scrub.
Dwarf Sedge, *Carex humilis*	Nationally Scarce	National	It is locally abundant in Wiltshire but is very scare elsewhere and is at its northern limit in Britain in the Avon Gorge and Wye Valley. There are some good populations on the Bristol side, but only two very small populations on the Somerset side. There is a small population on open grassland over Clifton Bridge No. 2 Tunnel which has been subject to conservation work by Bristol University, and on the railway, about 100 m to the south, there is a single, heavily shaded, relict plant above the south (Bristol) portal of Clifton Bridge No. 2 Tunnel.

Table 9.17: Notable and Important Plant Species

Species	Status[7]	Importance	Location
Dwarf Mouse-ear, *Cerastium pumilum*	Nationally Scarce	National	The Avon Gorge is one of its longest and best-known localities, but it has shown a marked decline over the last decade. On the Bristol side it is known at several sites on St Vincent's Rocks, the Gully and Sea Walls, but only in very small numbers. There are 3 extant populations on the Somerset side, and a number of old sites where it has not been seen in recent years. It occurs on the rocks by the River Avon Tow Path at Clifton Bridge No. 1 Tunnel south (Bristol) portal where it is threatened by scrub growth and used to occur above the cutting on the steep rocks on the west side.
Basil thyme, *Clinopodium acinos (Acinos arvensis*)	NERC Act 2006, Section 41 species	National	In the Avon Gorge it is locally frequent on rocks, grassland and scree on both the Bristol and Somerset sides, but has never been fully documented. By the railway, it occurs on the rocks at Clifton Bridge No. 1 Tunnel (Bristol side).
Little Robin, *Geranium purpureum*	Nationally Scarce	National	Within the Avon Gorge this species is scattered on the Bristol side, but has only one site on the Somerset side at Clifton Bridge No. 1 Tunnel. It has been recorded above the Clifton Bridge No. 1 Tunnel south (Bristol) portal in the past but has not been seen recently due to scrub development. It also used to occur here beside the River Avon Tow Path by the tunnel. As it responds to disturbance and has a long-lived seed bank, suitable conservation management work may result in its reappearance.
Gloucester hawkweed, *Hieracium glevense*	Nationally Scarce	National	Gloucester hawkweed is recorded from about 30 sites nationally, but the Avon Gorge is the only site in Somerset, where it is scattered on rocks and in the old quarries, including a good colony on the screes in Quarry 2. On the railway it occurs in small quantity on the rocks over the Clifton Bridge No. 2 Tunnel north (Pill) tunnel exit.

Table 9.17: Notable and Important Plant Species

Species	Status[7]	Importance	Location
Hutchinsia, *Hornungia petraea*	Nationally Scarce	National	This Nationally Scarce annual of open calcareous grasslands and screes is more typical of upland sites than lowland rocks. In lowland Britain it is very rare, and the Avon Gorge has had good populations but it has shown a considerable decline in recent years. It is scattered throughout the Bristol side but on the Somerset side has only been known around the Clifton Bridge No. 1 Tunnel south (Bristol) portal. The population above the River Avon Tow Path just north of the portal is one of the three largest and most important remaining in the Avon Gorge. It may still occur by the *Veronica spicata* on the ramp on the west side above the cutting. The population above the River Avon Tow Path was lost following railway wall repointing works near the tunnel in 2009.
Pale St John's-wort, *Hypericum montanum*	Nationally Uncommon	County/District	It occurs throughout the Avon Gorge which is an important site nationally, but on the Somerset side it is known only on the Blockhouse Slope, in Quarry 4, beside the River Avon Tow Path at Quarry 3, and on the railway cess north and south of Quarry 3 Bridge. A small colony of 3 plants was found in Quarry 2 in 2018, on the rocks half way up the quarry face.
Ivy Broomrape, *Orobanche hederae*	Nationally Uncommon	County/District	In the Avon Gorge it is widespread and locally abundant where there is lots of ivy for it to grow on. It is locally frequent along the River Avon Tow Path, some populations of which are on Network Rail land; this species is not mapped in Appendix 9.10 Flora Survey: Avon Gorge Woodlands SAC / Avon Gorge SSSI (DCO Document Reference 6.25) as it occurs throughout the gorge and is locally abundant along the River Avon Tow Path.
Angular Solomon's-seal, *Polygonatum odoratum*	Nationally Scarce	National	In the Avon Gorge it only occurs on the Somerset side in two places. One population occurs in and above Quarry 4, and another very small population occurs on Network Rail land above the Quarry 3 cliff.

Table 9.17: Notable and Important Plant Species

Species	Status[7]	Importance	Location
Spring Cinquefoil, *Potentilla tabernaemontani*	Nationally Scarce	National	This perennial of calcareous grasslands is scattered in Britain, and the Avon Gorge and Mendip populations are amongst the most southerly. Within the Avon Gorge there are eight populations on rocks and in relict grasslands on the Bristol side, and three on the Somerset side. On the railway it occurs on the ramp above the cutting at the Clifton Bridge Tunnel No. 1 south (Bristol) portal, on the rocks and grassland adjacent to the River Avon Tow Path below (some of which is NR land), and beside the River Avon Tow Path at Quarry 1 on NR land.
Spiked Speedwell, *Veronica spicata*	Schedule 8, WCA	National	The Avon Gorge populations may be the biggest in Britain. On the Bristol side it occurs around St Vincent's Rocks, and only occurs on the Somerset side at Clifton Bridge No. 1 Tunnel south (Bristol). On the railway it occurs on the ramp and on the rock face of the cutting at the Clifton Bridge No. 1 Tunnel south (Bristol) end, and on the rocks adjacent to the River Avon Tow Path on NR land below. Both sites are threatened by scrub invasion.
Avon Whitebeam *Sorbus avonensis*	Nationally Rare IUCN 'Critically Endangered'	International	This Nationally Rare Avon Gorge endemic is known to have a clonal population of about 42 individuals. Most of the world population of c.42 trees are found beside the railway between Clifton Bridge No. 1 Tunnel and Clifton Bridge No. 2 Tunnel where 31 trees were recorded in the survey. One tree died in 2017 so there are now 30 on NR land.
Bristol Whitebeam *Sorbus bristoliensis*	Nationally Rare, IUCN 'Endangered'. Specified on the SAC description.	International	37 trees were recorded in survey which represents about 12% of the total world population of about 300 trees. It is widespread along the Avon Gorge on both limestone and Old Red Sandstone. Along the railway it occurs in roughly three areas - Nightingale Valley to Clifton Bridge No. 2 Tunnel (Pill portal), from Quarry 3 to Quarry 4, and from Quarry 6 Bridge to Sandstone Tunnel.

Table 9.17: Notable and Important Plant Species

Species	Status[7]	Importance	Location
Round-leaved Whitebeam *Sorbus eminens*	Nationally Rare, Red Data Book-listed British IUCN 'Vulnerable' and is a UK BAP priority species/NERC Act 2006 Section 41 species.	International	The total world population is over 800+ trees scattered from Cheddar to the Wye Valley, with most in the Avon Gorge. Detailed surveys in the gorge have now shown more plants than previously known, especially along the River Avon Tow Path-railway wall at the north end of the SSSI where however most plants are less than 1 m tall. Along the railway there are four main sites - Clifton Bridge No. 1 Tunnel to Quarry 3, Quarry 5 to Quarry 6 Bridge (the main population) with a secondary band from Quarry 6 Bridge to the Sandstone Tunnel (Bristol portal), and one isolated tree on the embankment overhanging the River Avon Tow Path just north of Miles Dock Bridge. 414 trees were recorded in the survey which represents about 50% of the total world population. Unfortunately 33 trees of this species had died by 2017, 25 having been removed by an unknown member of the public along the River Avon Tow Path and railway retaining wall.
Leigh Woods Whitebeam *Sorbus leighensis*	Nationally Rare, IUCN 'Endangered'.	International	Most of the world's c. 300 trees occur on the Leigh Woods side of the gorge, with 3 or 4 on the Bristol side. Along the railway most of the plants occur between Quarry 2 and Quarry 6 Bridge with the main concentration north of the Quarry 3 Bridge. 184 trees were recorded in the survey which represents about 61% of the total world population.
Grey-leaved Whitebeam *Sorbus porrigentiformis*	Nationally Scarce	National	With a total world population of about 500 plants, 50-60 trees are found in the Avon Gorge. Along the railway it occurs on the trackside cliff at Quarry 3 (7 trees) and one the slope above (4 trees).
Observatory Whitebeam *Sorbus spectans*	Nationally Rare, IUCN 'Endangered'.	International	It was only known from the Bristol side of the gorge until three poorly grown and shaded trees were discovered along the railway between Quarry 1 and Quarry 2 during the surveys. Over 60 trees occur on the rock cliffs and slopes of St Vincent's Rocks, so these represent about 5% of the total world population.

Table 9.17: Notable and Important Plant Species

Species	Status[7]	Importance	Location
Wilmott's Whitebeam *Sorbus wilmottiana*	This Nationally Rare, Red Data Book-listed IUCN 'Endangered'. Specified on the SAC description.	International	Scattered on both side of the Avon Gorge with total population of 97 trees in 2013 mostly on the Somerset side; some of these have succumbed to a disease and deliberate vandalism recently. Along the railway 14 trees were found between Quarry 1 and Quarry 2 and another 4 had died by 2017.

Amphibians

9.4.111 A pond located within 250 m of the scheme boundary was identified within Leigh Woods NNR on National Trust land (referred to as Stokeleigh Pond by the National Trust, pond 38 Volume 3, Book of Figures (DCO Document Reference 6.24); Figure 9.4). The pond does not show on aerial photography and records of GCN have not previously been identified for the area. A visit to the pond in late spring 2016 and May 2018 found it to be dry and the National Trust confirmed that it regularly dries out. It is therefore unlikely to be used as a GCN breeding pond. No other ponds suitable for GCN have been identified within 250 m of this element of the DCO Scheme. Common and palmate newts, frogs and toads are likely to be present across the scheme footprint and their numbers are regarded to be of **Local** importance.

Badgers

9.4.112 The results of the badger survey are presented in Appendix 9.6 Badger Survey Report (DCO Document Reference 6.25), which is a confidential document available to appropriate consultees.

9.4.113 The site is considered to be of **Local** importance for badgers.

Bats - roosts

9.4.114 Greater and Lesser horseshoe bats and Daubenton's bat *Myotis daubentonii* are known to be present within the Avon Gorge Woodlands SAC and Leigh Woods NNR. Records were also received from BRERC for other bat species including Leisler's bat, Common pipstrelle and Noctule *Nyctalus noctula*.

9.4.115 Bat surveys were undertaken around the four tunnels on the Portbury freight line in 2015 (Appendix 9.2, Bat Technical Appendix, DCO Document Reference 6.25). The surveys were undertaken to identify summer roosting and autumn swarming potential of the tunnels and comprised trapping surveys, tunnel observations, automated dataloggers and daytime inspection. Winter hibernation surveys were undertaken from December 2015 to February 2016 and February to March 2018.

9.4.116 The Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel and Sandstone Tunnel are being used by low numbers of bats as day roosts during summer, but there are no confirmed maternity roosts in any of the tunnels. Clifton Bridge No. 2 Tunnel has been confirmed as a night roost, but Clifton Bridge No. 1 Tunnel and Sandstone Tunnel are almost certainly also likely to be used for night roosting given their locality within the Avon Gorge Woodlands. There was no swarming behaviour (associated with mating) at the tunnels, but surveys in autumn recorded social activity and bats appear to use the shelter of the tunnels for socialising.

9.4.117 Low numbers of bats have been recorded using winter hibernation roosts in Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel and Sandstone Tunnel. The roost resource in Clifton Bridge No. 1 Tunnel is limited by the availability of crevice features and absence of enclosed voids in this relatively small tunnel. Clifton Bridge No. 2 Tunnel and Sandstone Tunnel are larger with more stable underground environments for hibernating bats.

9.4.118 The use of the tunnels by bats is summarised and evaluated in Table 9.18 below.

Table 9.18: Evaluation of the Bat Roost Resource on the Portbury Freight Line

Tunnel	Survey findings	Importance on a Geographical Scale
Clifton Bridge No. 1 Tunnel 54 m long Fully brick-lined except for relieving arches	A solitary natterer's bat has been confirmed roosting in the tunnel during summer and hibernating in winter. Surveys indicate that solitary or low numbers of common pipistrelle bats may also roost in the tunnel in summer. The surroundings are relatively well lit at night because of street lighting on Clifton Suspension Bridge and the A4 road. A low level of social activity was recorded in autumn.	**Immediate zone of influence only**
Clifton Bridge No. 2 Tunnel 210 m long c80% unlined, c20% brick-lined.	The tunnel is used throughout the year by roosting bats. Low numbers of lesser horseshoe, common pipistrelle and Daubenton's bats day roost during summer. *Myotis* sp. are also known to use the tunnel as a night roost at this time of year. Lesser horseshoe bats hibernate in the tunnel in winter. During autumn, Clifton Bridge No. 2 Tunnel attracts social activity. It is evident from datalogger monitoring that there is regular activity and there are peaks in activity during the night. Whilst the level of activity is much lower than would be expected at a swarming site, peaks of activity on an hourly basis suggest that low numbers of lesser and greater horseshoe bats and *Myotis* sp. may be gathering and socialising at the tunnel. Male brown long-eared bats were captured near the tunnel portal in September and were possibly gathering for mating.	**District**

Table 9.18: Evaluation of the Bat Roost Resource on the Portbury Freight Line

Tunnel	Survey findings	Importance on a Geographical Scale
Sandstone Tunnel 80 m long Fully stone block and brick lined.	Bat droppings in the tunnel confirm that crevices are being used by serotine bat and Daubenton's bat. The time of year these species are roosting in the tunnel has not been confirmed, but it is possible crevices are being used by low numbers of bats throughout the year. Winter surveys confirm Sandstone Tunnel is used for hibernation by brown long-eared bats, *Myotis* sp. (probable natterer's) and possibly barbastelle bat. Surveys in autumn confirm that Sandstone Tunnel is important for social activity. It is evident from datalogger monitoring that there is regular activity and peaks in activity during the night. Whilst the level of activity is significantly lower than would be expected at a swarming site, peaks of activity on an hourly basis suggest that low numbers of bats may be gathering and socialising at the tunnel. Greater horseshoe bats, *Myotis* sp. and long-eared bats socialise at Sandstone Tunnel. Trapping surveys caught male serotine bats, brown long-eared bats and Natterer's bat near the tunnel. These adult males may be gathering for mating.	**District**
Pill Tunnel 609 m long Fully brick-lined.	No evidence of bats roosting was recorded, although the tunnel has potential for bats to roost in crevices in the brickwork. Water ingress through the brick lining of the during wet weather is likely to deter roosting bats and prevent hibernation. During autumn, it is evident that social activity occurs at the site, but the level of activity is lower than other tunnels and peaks in activity (that indicates sustained activity) are less frequent. Where there are occasional peaks in activity, this tends to be by greater horseshoe bats or *Myotis* sp. Observational data from swarming activity surveys support the assertion that low numbers of bats use the tunnel in autumn.	**Immediate zone of influence only**

9.4.119 Two stone arches at Pill station are used by low numbers of horseshoe bats and are a bat roost resource of **Local** importance. The station has fallen into disrepair since its closure in 1964. The stone arches on the disused northern platform at Pill station are a day roost for lesser horseshoe bats and a night roost for lesser and greater horseshoe bats. Low numbers of bats are using the structures, with observational survey data confirming solitary animals shelter during summer.

9.4.120 A preliminary bat roost assessment of Pill Station House (at 7 Station Road, Pill) identified moderate potential for crevice dwelling bats to roost in the roof of the building in summer, but the subsequent dusk surveys in 2018 confirmed the absence of bats during the breeding season. The level of bat activity recorded in the vicinity of Pill Station House by surveyors watching the building was very low.

9.4.121 Fourteen bridge and viaduct structures on Portbury Freight Line, including a small store building on the adjacent towpath and an underground bunker at the premises of Babcock International Group have been surveyed for bat roosts. A preliminary bat roost assessment was undertaken on 13 structures and one structure (Avon Road Bridge) was subject to more detailed assessment with two dusk surveys. 12 structures were considered to have negligible bat potential for roosting bats because there were no cracks, crevices or features that would allow bats access to shelter in the fabric of the structures. One structure (the small store on the towpath) has low potential as a night roost but the absence of field signs suggests the store is not well used. There are signs of use by homeless people, which may deter bats from night roosting. No bats were recorded roosting within the Avon Road Bridge. The two dusk surveys (July and September 2016) provide sufficient information to indicate the likely absence of bat roosts in the structure. The bridges, viaducts and other structures are considered to be of importance within the **zone of influence only** for roosting bats.

9.4.122 A winter survey of the caves and adits within the Avon Gorge was undertaken in 2018 to obtain an understanding of the hibernation roost resource. The caves and adits within the Avon Gorge Woodlands are considered to be an important underground roost resource for bats within the **Local** context.

9.4.123 The preliminary assessment of the bat roost resource of trees has identified trees with bat roost potential (Appendix 9.2, Bat Technical Appendix, DCO Document Reference 6.25). The woodland within NR land is considered to be of **Local** importance for roosting bats.

Bats – navigational route

9.4.124 A Horseshoe bat roost is located at Pill Station arches on the disused northern platform at Pill station. It is also thought that the freight line, particularly between Pill Viaduct and Avon Road, is an important navigational route for horseshoe bats due to this being a sheltered corridor. Bat surveys using data loggers were undertaken along the freight line from Pill Viaduct to the junction with the disused line to collect data 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. The overall importance as a roost habitat and linear landscape feature for bats is of value at a **local** level.

9.4.125 No bat activity surveys have been completed for the rest of the Portbury Freight Line because the DCO Scheme will not affect the foraging and commuting habitats elsewhere.

Birds

9.4.126 Numerous bird records have been provided for the search area. These include Red List species (Eaton *et al*., 2015), birds listed under Section 41 of the NERC Act and species listed in Schedule 1 of the WCA. There are records for ground nesting species, raptors, wetland and passerine species.

9.4.127 Ornithological surveys have been undertaken at Pill and are reported in full in Appendix 9.3b Wintering Bird Survey (DCO Document Reference 6.25).

9.4.128 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 qualifying species for the Severn Estuary SPA/Ramsar.

9.4.129 Low numbers of redshank were recorded. The peak count of this species 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.

9.4.130 The count of the SPA/Ramsar-qualifying species made during baseline surveys were compared with Wetlands Bird Survey (WeBS)[8] data for Pill Marshes compiled by the British Trust for Ornithology[9]. Table 9.19 indicates the low usage of this area of the SPA. The most recent WeBS data (2012/3 – 2017/18) have been used in this report, and therefore numbers differ from those in Appendix 9.3b Wintering Bird Survey (DCO Document Reference 6.25).

9.4.131 Surveys indicate that the qualifying species of the SPA/Ramsar do not occur in significant numbers within the survey area (i.e. <1% of the estuary population of redshank with no other qualifying species recorded). Those qualifying species that occurred within the survey area (redshank) were restricted to the intertidal area.

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[8] 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.

[9] 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/

Table 9.19: Summary of Redshank counts at Pill Marshes compared with WeBS data

Qualifying feature	Peak count during surveys in 2014/2015	WeBS 5 year average (2012/13-2017/18)	Count at Pill Marshes as a percentage of estimated SPA population
Redshank	28 (Jan 2015, high tide)	5,720	0.49

9.4.132 Curlew was also recorded in the survey area, a species cited in the River Severn SSSI citation. The peak count was 2 curlew and this represents 0.05% of the Severn Estuary population (five-year peak mean counts from the SPA is 3903).

9.4.133 The bird assemblage of the survey area at Pill Marshes is assessed as being of **Local** importance.

9.4.134 During the 2014 Phase 1 Habitat Survey (Appendix 9.1, Extended Phase 1 Habitat Survey, DCO Document Reference 6.25) passerine birds were present throughout Portbury Freight Line. Species recorded were blackbird, goldfinch *Carduelis carduelis,* wren *Troglodytes troglodytes*, dunnock *Prunella modularis,* common gull *Larus canus,* jay *Garrulus glandarius,* carrion crow *Corvus corone*, pheasant *Phasianus colchicus*, great tit *Parus major*, long-tailed tit *Aegithalos caudatus*, robin and starling *Sturnus vulgaris*, with coot *Fulica atra* and mallard *Anas platyrhynchos* on waterbodies beyond the site. These species are common and widespread and the passerine bird assemblage is considered to be of **Local** importance.

9.4.135 Records of peregrine falcon are known from the western side of the Avon Gorge (BRERC, 2014). Seven potential peregrine falcon roosting/nesting locations were identified on cliff habitats within the Avon Gorge (Appendix 9.3c, Ornithology Report – WCA Schedule 1, DCO Document Reference 6.25, which is a confidential document available to appropriate consultees). A potential peregrine nesting site was identified on a nest known to have been formerly occupied by breeding ravens, and an adult bird was seen sitting on the nest with another nearby on the second visit. However, no sign of young birds or feeding behaviour was seen either at or near the nest and no signs of peregrine activity were observed so peregrine breeding appears not to have occurred here in 2017 (but may potentially occur in future years). The exact locations of potential nest sites identified are confidential and details are available to appropriate consultees.

9.4.136 A Phase 1 Habitat Survey in March 2018 (Appendix 9.1, Extended Phase 1 Habitat Survey, DCO Document Reference 6.25) identified the M5 Avonmouth Bridge as potential Peregrine habitat.

9.4.137 The survey area is considered to be a **Locally** important resource for Peregrine.

Dormice

9.4.138 The hazel dormouse is listed under Schedule 5 of the WCA and fully protected under section 9 of the WCA and Schedule 2 of Habitats Regulations 2017. Records of dormice are known from Leigh Woods NNR, Ham Green Lake and habitat along the Avon Gorge.

9.4.139 The whole route of the railway through the SAC crosses habitat suitable for dormouse. A dormouse survey was undertaken along a 700 m section of railway on the Portbury Freight Line between Clifton Bridge No. 1 Tunnel and the southern end of the SAC from April to September 2015 (Appendix 9.7, Dormouse Survey Report, DCO Document Reference 6.25).

9.4.140 No dormice or dormouse nests were found in the trees/scrub immediately adjacent to the 700 m section of railway line. The railway corridor is disturbed by freight trains and users of the River Avon Tow Path so is not optimum dormouse habitat. Nevertheless, this does not mean they are absent from the wider area, and they should be assumed as present in the wider woodland. In high quality mature woodland habitats dormice may not be as prevalent in their use of nest tubes, as there are likely to be a number of natural alternative opportunities. This assumption is based on records of dormice using nest boxes in woodland in the wider area (Natural England, pers. comm.). Therefore the survey area was assessed as being of **Local** importance to dormice, although the wider woodland is to be of **National** importance and protection of dormice has been considered in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14).

9.4.141 An access track which connects Chapel Pill Lane in Ham Green to Pill Tunnel portal (OS NGR ST 533755) was also surveyed for dormice in 2015 (Appendix 9.7, Dormouse Survey Report, DCO Document Reference 6.25). No signs of dormouse were found and the survey area is considered to be of **Local** importance to dormice.

Reptiles

9.4.142 Records of slow worms have been recorded in the gardens of Lodway and Pill. Grass snakes, slow worms and viviparous lizards have also been recorded within the Avon Gorge and in habitats adjacent to the Portbury Freight Line.

9.4.143 A reptile survey was undertaken between 1st and 25th September 2015 along the freight line between Lodway Close in Pill and a location approximately 100 m west of Pill Tunnel western portal (Appendix 9.5 Reptile Survey Report, DCO Document Reference 6.25). A medium population of Slow worms and a low population of Grass snakes were found.

9.4.144 The vegetative structure and connectivity of the site in Pill provides excellent reptile habitat. Key components of the site include south facing banks, variable structure, good connectivity and lack of disturbance. Reptiles were found within areas of grass, tall ruderal, bramble and occasionally within sparsely vegetated sections of ballast. Considering the size of the reptile population, high quality habitat and connectivity it is considered to be of **District** importance for reptiles.

9.4.145 Other suitable areas of the freight line were also surveyed for reptiles in 2015 (Appendix 9.5, Reptile Survey Report, DCO Document Reference 6.25) and reptiles were found in small numbers near Clifton Bridge No. 1 Tunnel and Clifton Bridge No. 2 Tunnel, north of the A370 Ashton Road and around Barons Close. These areas are considered to be of **Local** importance for reptiles.

Invertebrates

9.4.146 Numerous invertebrate records have been provided for the search area (BRERC, 2014), including records for notable beetles, dragonfly and other odonata, grasshoppers and crickets, butterflies and moths, many of which are listed on Schedule 5 of the WCA 1981 and protected under Section 9, UK and Avon BAP and under Section 41 of the NERC Act. Four notable species of butterflies have been recorded in Leigh Woods and Avon Gorge; white letter hairstreak *Satyrium w-album*, chalk-hill blue *Lysandra coridon*, pearl-bordered fritillary *Boloria euphrosyne* and marsh fritillary *Euphydryas aurinia.* Small blue butterfly *Cupido minimus* may be present as well because the habitat is suitable and it is present on the Bristol side of the Avon Gorge. The Avon Gorge supports the silky wave moth *Idaea dilutaria* which only occurs in one or two places in Wales, and occasionally in England. The site is considered to be of **County** importance to invertebrate species due to the presence of notable species.

Otter

9.4.147 BRERC (2014) returned one record of an otter spraint on the saltmarsh of the River Avon near Ashton Avenue Swing Bridge, Ashton Gate in Bristol. Otters are known to use the River Avon and Floating Harbour in Bristol.

9.4.148 An otter assessment and survey were undertaken in October 2015 (Appendix 9.8 Otter Survey Report, DCO Document Reference 6.25). Otter spraint was found at Ham Lake, confirming presence. The woodland and lake habitat here is optimal for otters and is linked to the River Avon. The habitat along the River Avon adjacent to the freight line is suitable otter habitat but is disturbed by regular use of the River Avon Tow Path by pedestrians and cyclists. The site is considered to be of **District** importance due to the extent of habitat and the regular use by otters along the River Avon.

Invasive Species

9.4.149 Eighteen non-native and potentially invasive plant species were recorded within the survey area, including six species listed on Schedule 9 of the WCA. Some of the invasive species, although not of nature conservation value themselves, represent a significant threat to the internationally important habitats and species of the Avon Gorge SAC.

Norway maple *Acer platanoides*

9.4.150 This deciduous tree, which has escaped from gardens, is widespread in the Avon Gorge and along the railway but is not considered a particular problem species by NE at present.

Sycamore *Acer pseudoplatanus*

9.4.151 Although a typical component of the *Tilio-Acerion* forests of slopes, screes and ravines SAC habitat in its native range in Europe, this deciduous tree is very widely naturalised in Britain, often dominating woodland. It is common and widespread in the Avon Gorge as both mature trees and regenerating seedlings and saplings and is very frequent along the railway line. Although it is an invasive species, NE does not recommend that sycamore is proactively removed in the Avon Gorge.

Keeled garlic *Allium carinatum*

9.4.152 This garden escapee is invasive in grassland habitats and has been recorded in several sites along the railway River Avon Tow Path (e.g. between NGR ST5644473023 to NGR ST5646472946, and north of Clifton Bridge No. 2 Tunnel). NE considers this species as an issue for woodland and grassland habitats and recommend that it is removed.

Butterfly bush *Buddleja davidi*

9.4.153 This garden shrub is widely invasive. It occurs in many places in the Avon Gorge, especially along the railway, the River Avon Tow Path and embankments and can form some dense patches or be mixed amongst other shrubs.

Sweet chestnut *Castanea sativa*

9.4.154 This tree has been widely grown for the edible fruits and is occasionally naturalised. In the Avon Gorge there are trees along the lower edge of the wood between Quarry 5 and Quarry 6, perhaps where they were originally planted. Although it is an invasive species, NE does not recommend that sweet chestnut is proactively removed in the Avon Gorge.

Red valerian *Centranthus ruber*

9.4.155 This garden plant is extensively naturalised on calcareous rocks throughout Britain and is hard to control. It occurs widely on the exposed limestone rocks where it competes with rare plants such as spiked speedwell and Bristol rock-cress. It is widespread along the limestone exposures of the railway line in the Avon Gorge, and sometimes on the ballast. NE suggests that removal of this plant should be a priority on NR land, although control measures have not yet been fully explored.

Cotoneaster *Cotoneaster species (C. simonsii, C. microphyllus)*

9.4.156 Cotoneaster species, which include the Schedule 9 species *C. simonsii* and *C. microphyllus* and possibly *C. integrifolius*, are widespread in the Avon Gorge on rocks and scrub edges and are frequent along the railway on rock outcrops. *C. microphyllus* can form dense patches which over-grow the native plants. This plant is being extensively controlled on National Trust land and a wider control program is needed throughout the Avon Gorge NE suggests that the removal of this plant should be a priority on NR land.

Japanese knotweed *Fallopia japonica*

9.4.157 This is a widely invasive Schedule 9 species. There are several stands in woodland along the railway's western boundary south of Clifton Bridge No. 1 Tunnel, one of which has been treated with herbicide and shows significant dieback, but several other stands in the area along both boundaries of the railway corridor have not been treated. Another stand is present in the Ashton Vale area of the freight line. NE suggests that the removal of this plant should be a priority on NR land.

Himalayan balsam *Impatiens glandulifera*

9.4.158 Himalayan balsam is a widely invasive Schedule 9 species. There is a small population in woodland west of the railway in the old quarry south of Clifton Bridge No. 1 Tunnel.

Virginia creeper *Parthenocissus quinquefolia*

9.4.159 A few small shoots of this Schedule 9 species were seen growing out of ballast along the railway's eastern boundary at NGR ST 5658272423.

Cherry laurel *Prunus laurocerasus*

9.4.160 This evergreen shrub can form dense thickets which shade out ground flora species. It is widespread in the Avon Gorge and frequent on the railway land (e.g. at the old Nightingale Valley station and Miles Dock). It has been controlled on National Trust land and a wider control program is needed throughout the Avon Gorge.

Turkey oak *Quercus cerris*

9.4.161 This deciduous oak is invasive in woodland and scrub habitats and may have escaped from former cultivation in the Leigh Woods forests. It is scattered along the railway in a small quantity, but is locally frequent in the Sandstone Tunnel area.

Holm oak *Quercus ilex*

9.4.162 This evergreen tree is probably the biggest invasive species problem in the Avon Gorge. The dense shade and large size results in shading out of many species and it is tolerant of drought on shallow soils so colonises open limestone rocks where rare plants grow. Along the railway it can form dense stands, for example around the Clifton Bridge No. 2 Tunnel portal. It has been controlled on National Trust land and a wider control program is needed throughout the Avon Gorge. NE suggests that the removal of this plant should be a priority on NR land.

Red oak *Quercus rubra*

9.4.163 This deciduous oak has been cultivated in Leigh Woods and is locally frequent in the Sandstone Tunnel area and rarely elsewhere. NE suggests that the removal of this plant should be a priority on NR land.

Rhododendron *Rhododendron ponticum*

9.4.164 This Schedule 9 invasive species is an evergreen which can form dense stands and shades out ground flora. It is locally frequent in the Sandstone Tunnel area and requires coordinated control. NE suggests that the removal of this plant should be a priority on NR land.

Japanese rose *Rosa rugosa*

9.4.165 This Schedule 9 invasive garden rose can form dense thickets and is invasive in some habitats such as sand dunes. In the Avon Gorge there is one white-flowered clump by the River Avon Tow Path at Clifton Bridge No. 2 Tunnel north portal (NGR ST 56217379).

Snowberry *Symphoricarpos albus* and hybrids

9.4.166 This rhizomatous shrub can spread to form dense thickets which are hard to eliminate. It is occasionally naturalised in the Avon Gorge, especially along the railway (for example, it is dominant in woodland between the railway and River Avon Tow Path, extending 30 m northwards from just north of the bridge at NGR ST 5657372471 and is locally dominant along the western railway boundary NGR ST 5652672630.

Laurustinus *Viburnum tinus*

9.4.167 This evergreen garden shrub or small tree is occasionally naturalised in Britain and forms dense shade. In the Avon Gorge it occurs on both sides, and along the railway mainly as isolated trees or shrubs.

Water vole

9.4.168 No suitable water vole habitat was identified within the Portbury Freight Line section and water voles are not considered further.

9.4.169 **Summary**

A summary of importance and likelihood of significant effects (requiring detailed assessment) on all the habitat and species detailed in this section is presented in Table 9.20.

Table 9.20: Summary of importance and likelihood of significant effects (requiring detailed assessment) on ecological features, Portbury Freight Line

Feature	Nature Conservation Protection	Importance of feature	Potential for Effect	Subject to detailed assessment
11 SAC/SPA or Ramsar sites	Habitats Regulations	International	Habitat loss, construction and operational disturbance	Yes, due to importance of feature
9 SSSIs, NNR and Ancient woodland sites	WCA	National	Habitat loss, Construction and operational disturbance	Yes, due to importance of feature
39 Wildlife Sites or SNCIs	NSC Core Strategy Policy CS4, Bristol Core Strategy Policy BCS9, Bristol Site Allocations and Development Management Policies Policy DM19.	County/District	Habitat loss and disturbance, operational disturbance.	Yes, due to importance of feature
Scrub	WCA (in SSSI) Elsewhere None	Within the Avon Gorge Woodlands SAC/SSSI – National Elsewhere - Zone of influence	Loss of habitat	Within the SAC/SSSI - Yes, due to importance of feature

Table 9.20: Summary of importance and likelihood of significant effects (requiring detailed assessment) on ecological features, Portbury Freight Line

Feature	Nature Conservation Protection	Importance of feature	Potential for Effect	Subject to detailed assessment
				Elsewhere - No, feature below threshold for detailed assessment
Trees and Woodland	WCA, Habitats Regulations	Ancient woodland and Secondary (Recent) woodland within the SAC/SSSI - International	Loss of habitat	Yes, due to importance of feature
Introduced scrub	None	Zone of influence	Loss of habitat	No, feature below threshold for detailed assessment
SAC Grassland	WCA, Habitats Regulations	International	Loss of habitat	Yes, due to importance of feature
Tall ruderal	None	Zone of influence	Loss of habitat	No, feature below threshold for detailed assessment
Ephemeral/short perennial	None	Where notable species present – National Other areas - Zone of influence	Loss of habitat	Where notable species present - Yes, due to importance of feature Elsewhere - No, feature below threshold for detailed assessment

Table 9.20: Summary of importance and likelihood of significant effects (requiring detailed assessment) on ecological features, Portbury Freight Line

Feature	Nature Conservation Protection	Importance of feature	Potential for Effect	Subject to detailed assessment
Watercourses	NSC Core Strategy Policy CS4, Bristol Core Strategy Policy BCS9, Bristol Site Allocations and Development Management Policies Policy DM19.	County/District	Construction and operational disturbance	Yes, due to importance of feature
Ponds	None	Local	None	No
Structures with SAC habitats e.g. tunnels	WCA, Habitats Regulations	International	Loss of habitat	Yes, due to importance of feature
Plants, nationally rare/notable	WCA	Rare whitebeams – International Other rare/notable plants – up to National	Loss of habitat	Yes, due to importance of feature
Great Crested Newts	Habitats Regulations, WCA	Local	None (likely absence of GCN)	No
Badgers	The Protection of Badgers Act 1992	Local	Disturbance and harm	Yes, due to legal protection
Bats – tunnels	WCA, Habitats Regulations	District/Local/Zone of influence	Construction and operational disturbance	Yes, due to legal protection
Bats – Pill Station Arches	WCA, Habitats Regulations	Local	Construction and operational disturbance	Yes, due to legal protection

Table 9.20: Summary of importance and likelihood of significant effects (requiring detailed assessment) on ecological features, Portbury Freight Line

Feature	Nature Conservation Protection	Importance of feature	Potential for Effect	Subject to detailed assessment
Bats – bridges, viaducts and other structures	WCA, Habitats Regulations	Local/Zone of influence	Loss of habitat, disturbance	No, due to no evidence of use by bats and negligible/low potential for roosting bats
Bats - trees	WCA, Habitats Regulations	Local	Loss of habitat, disturbance	Yes, due to legal protection and potential for roosting
Bats - caves	WCA, Habitats Regulations	Local	None	No
Bats – navigational route at Pill for horseshoe bats roosting at Pill Station Arches		Local	Operational disturbance	Yes, due to legal protection of roost
Nesting birds – passerine	WCA	Local	Loss of habitat, disturbance	Yes, due to legal protection
Birds – overwintering near Pill in association with Severn Estuary SAC/SPA/Ramsar	WCA, Habitats Regulations	Local	Construction and operational disturbance	Yes, as part of River Severn SPA/Ramsar assessment
Birds – Peregrine falcon	WCA	Local	Construction and operational disturbance	Yes, due to legal protection

Table 9.20: Summary of importance and likelihood of significant effects (requiring detailed assessment) on ecological features, Portbury Freight Line

Feature	Nature Conservation Protection	Importance of feature	Potential for Effect	Subject to detailed assessment
Dormice	WCA, Habitats Regulations	In wider Avon Gorge woodland – National Along freight line - Local	Construction disturbance	Yes, due to legal protection
Reptiles	WCA	Up to District	Loss of habitat	Yes, due to importance of feature
Invertebrates	WCA	County	Loss of habitat	Yes, due to importance of feature
Otter	WCA, Habitats Regulations	District	Disturbance	Yes, due to importance of feature and legal protection
Plants, invasive non-native species	WCA, Schedule 9	None	Potential to cause the spread into the wild	Yes, due to potential to cause adverse effects on important habitats and species within the Avon Gorge SAC/SSSI.
Water vole	WCA	None	Likely absence of water voles	No

9.5 Measures Adopted as Part of the DCO Scheme

9.5.1 A number of measures have been included as part of the project design in order to minimise certain environmental effects. These include:

- careful design of the project to ensure key receptors are avoided where possible. These measures are not necessarily required to mitigate likely significant effects but have been identified as those that can avoid or reduce effects on ecology and biodiversity and have been incorporated within the design of the DCO Scheme;
- construction adopting best practice techniques, which are introduced in the Code of Construction Practice ("CoCP") (ES Appendix 4.1, DCO Document Reference 8.15) and presented in more detail in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14); and
- compliance with regulatory and legislative regimes as required by law.

Design Features

9.5.2 Measures that have been incorporated within the scheme design are presented in Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7). Those measures that are specific to ecology and biodiversity are summarised below.

9.5.3 Where modifications to the design of the DCO Scheme have been identified as part of the iterative design process that reduce or avoid the potential for adverse ecological or biodiversity effects these form part of the description of the project for which the DCO is sought and there is no need for further steps to be taken as these measures will be delivered as part of the DCO Scheme.

9.5.4 Portishead car park design includes a swale, French drain, with trees, scrub and long grass along the southern edge to connect great crested newt habitats along the Portbury Drain to Quays Avenue (DCO Document Reference 2.38 Portishead Station Car Park Layout, Landscaping and New Boulevard and Access Plan).

9.5.5 A reptile underpass will be provided under the new highway west of Quays Avenue, Portishead (Environmental Masterplan, DCO Document Reference 2.53). This will provide connectivity to habitats on either side of the road along the railway corridor to help avoid fragmentation of reptile habitat in the new car park area at Portishead.

9.5.6 [Paragraph deleted from revised version.]

9.5.7 The Sheepway maintenance compound and track to minimise land take from Portbury Wharf Nature Reserve.

9.5.8 The derelict store located to the west of Station Road will be kept within the DCO Scheme, thereby avoiding impacts on the night roost used by Lesser and Greater horseshoe bats.

9.5.9 No lighting is proposed for the national cycle network route 26 ("NCN26") and bridleway extension under the M5 Motorway. The route has been designed to be as close to the M5 embankment and an existing track as possible to avoid otter habitat comprising standing water, woodland and scrub.

9.5.10 The design of Pill Tunnel Eastern Portal compound (DCO Document Reference 2.46 Pill Tunnel Eastern Portal Compound, Landscaping and Access Plan) includes woodland planting at the eastern side between the compound and Ham Green Lakes to reduce disturbance of otters.

9.5.11 Pill Station car park design (DCO Document Reference 2.42 Pill Station Car Park and PSP Layout Landscaping, Lighting and Access Plan) includes planting of scrub and long grass between the car park and the Portbury Freight line to provide habitat for reptiles.

Control of construction-related impacts

9.5.12 Measures to control construction activities that may impact on ecological features are set out in the CoCP (Appendix 4.1, DCO Document Reference 8.15) and described in more detail in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The successful contractors will be required to prepare and implement their own CEMP in accordance with the CoCP and the Master CEMP. Key aspects of the CoCP and the Master CEMP are:

- The contractor/ applicant will appoint an Ecological Clerk of Works ("EcCoW") to ensure compliance with the ecological mitigation measures set out in the CEMP.
- Minimise vegetation removal by maintaining the vegetative feature intact as long as possible, only clear the minimum vegetation required (including keeping any gaps to the minimum required for the purpose) and restoring the vegetation as soon as possible.
- The site extents and areas of site clearance and retained habitat will be demarcated to prevent accidental incursions by construction plant and equipment.
- Vegetation clearance for temporary construction works will be reinstated where required following the completion of construction. Trees to be retained on site should be protected where feasible by protective fencing prior to the commencement of works to prevent encroachment of plant and accidental damage of the habitat.
- The Contractor will take measures to mitigate dust and air quality, noise and vibration, and protection of the water environment, respectively, to protect ecologically important habitats and species adjacent to the construction site.
- General measures to be implemented by the Contractor on the DCO Scheme include:
  - the Contractor will have regard to the Environment Agency's Pollution Prevention Guidance ("PPG") during works close to ditches, watercourses and culverts;
  - cover all excavations overnight or provide appropriate escape ramps for mammals in the form of a sloped face to the excavation or a scaffold plank or similar where practicable;
  - visually check uncovered excavations for the presence of wildlife each morning before works commence and notify the EcCoW immediately in the event that an animal is found so that they can action an applicable rescue;

- All staff on site shall receive a briefing on the ecological sensitivities as part of their site induction. This briefing shall highlight where works shall be undertaken under the supervision of an EcCoW.
- Where applicable, pre-construction surveys will be undertaken to determine the current status and distribution of protected and notable species. Where statutorily protected species are found to be present during surveys, mitigation strategies and where relevant applications for licences to Natural England will be prepared. These will ensure that recommended measures to protect the species are secured during both construction and operation phases. The licences and consents identified for the DCO Scheme on the basis of surveys to date are set out below.

Licences and Consents

9.5.13 Owing to the presence of protected species in the vicinity of the DCO Scheme and the legislative framework for their protection (irrespective of whether effects on these species are predicted to be significant or not significant), it is likely that protected species licences will be required for badgers, bats, and great crested newts. Draft protected species licence applications are being prepared.

9.5.14 The DCO Scheme has received consent under Natural England's DLL scheme for great crested newts.

9.5.15 As the need for the licences arises from the presence of the protected species and the potential for disturbance of them, in accordance with the WCA 1981, The Protection of Badgers Act 1992 and the Conservation of Habitats and Species (England) Regulations 2017, the need for a licence is not determined by whether or not the nature and extent of the predicted effect is a likely significant environmental effect for the purposes of the EIA Regulations 2017. The assessment of effects assumes that the mitigation described in the draft licences for badgers and bats will be implemented. However, the draft licence for great crested newts is site specific and less generic and has therefore been assessed without the measures in place and mitigation is detailed in Section 9.7 of this chapter.

9.5.16 SSSI Assent for works affecting the Avon Gorge SSSI will be required and a licence obtained for uprooting or destruction of WCA Schedule 8 plants.

9.6 Assessment of Effects

Construction Phase

Portishead to Pill

Designated sites - Severn Estuary SAC/SPA/Ramsar/SSSI

9.6.1 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. Assessment of AWT bird survey data has indicated that a relatively small number of SPA/Ramsar birds use the nature reserve (the overall waterfowl assemblage contains up to 0.5-0.66% of the populations of the designated sites as a whole (see Appendix 9.3a, Ornithology of Portbury Wharf Nature Reserve, DCO Document Reference 6.25).

9.6.2 The potential for impacts on the Severn Estuary SPA and Ramsar is primarily via noise and visual disturbance of SPA and Ramsar-qualifying bird species.

9.6.3 The evidence used in the assessment of noise and visual impacts at 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%).

9.6.4 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.

9.6.5 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.

9.6.6 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). 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 (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) and therefore no impacts on SPA and Ramsar-qualifying birds are anticipated.

9.6.7 The magnitude of the impact is negligible and the significance of the effect is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017.

9.6.8 The effect of the DCO Scheme on the Severn Estuary designations in the vicinity of Pill is described in paragraphs 9.6.54 – 9.6.56 of this chapter.

Designated sites - North Somerset and Mendip Bats SAC

9.6.9 No construction works are proposed within the North Somerset and Mendip Bats SAC, but greater horseshoe bats using the SAC rely on habitats outside the designated site boundaries. Greater horseshoe bats associated with the SAC have been recorded on the disused railway line.

9.6.10 The disused railway line is beyond the 'core sustenance zone' (which is broadly defined as key foraging habitats within 5 km of the SAC) of Brockley Hall Stables SSSI, where the maternity roost is located, and is therefore not considered to be significant for breeding female greater horseshoe bats, or the rearing of their young. However, it is evident that extended distances to foraging areas do occur when bats use alternative day roosts (i.e. 'satellite' roosts away from the maternity roost). The pattern of movement between satellite day roosts was observed during surveys for the DCO Scheme (Appendix 9.2, Bat Technical Appendix, DCO Document Reference 6.25), with the male greater horseshoe bat tracked 9.2 km from the disused railway line to Brockley Hall Stables SSSI over three nights in 2015. More importantly, the pregnant female tracked in 2018, also used 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. 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.

9.6.11 The rare lesser and greater horseshoe bats regularly occur between the Portbury Wharf Area and Royal Portbury Dock (Appendix 9.2, Bat Technical Appendix, DCO Document Reference 6.25). Greater horseshoe bat activity was highest at the west end of the disused railway line and seasonal monitoring found peak levels of activity were in June. Notwithstanding the variations in greater horseshoe bat activity, 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. 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'. Population studies have shown 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 echolocation 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).

9.6.12 The proposed works will result in the reduction and removal of a linear corridor of trees and scrub to facilitate the construction and operation of the DCO Scheme. This will result in the loss of the physical structure of the corridor and 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 Motorway.

9.6.13 The SAC is of international importance and the magnitude of impact by the partial loss of the navigational route is moderate. The significance of the effect is likely to be **large adverse** and is significant in terms of the EIA Regulations 2017.

9.6.14 The other internationally and nationally designated sites are of sufficient distance to be unaffected by the DCO Scheme. Further information regarding the impacts on of the internationally designated sites is provided in Appendix 9.12 Report to Inform HRA (DCO Document Reference 5.5).

Non-statutory designated sites

9.6.15 A summary of the effects of the DCO Scheme on non-designated sites is summarised in Table 9.21 below.

Table 9.21: Summary of potential effects on non-statutory designated sites

Designated site	Likelihood of impact
Portbury Wharf Nature Reserve North Somerset Wildlife Site ("NSWS") AWT Nature Reserve from 2010-2015)	Sheepway construction compound will lead to a temporary loss of 0.6 ha of improved grassland at Portbury Wharf Nature Reserve, of County importance. The area temporarily lost is 1.3% of the Nature Reserve and the land will be reinstated post construction. The magnitude of impact is negligible and the significance of effect is **neutral**. Installation of the Sheepway permanent maintenance compound and track will lead to a permanent loss of 0.1 ha of improved grassland at Portbury Wharf Nature Reserve, which is less than 1% of the Nature Reserve area. The magnitude of impact is negligible and the significance of effect is **neutral**. Temporary indirect impacts from construction, noise, dust and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral.** The effects are considered to be not significant in terms of the EIA Regulations 2017.
Field east of M5 Motorway, Lodway NSWS	The bridleway extension under the M5 will comprise a 3 m wide bridleway with fence and lead to a permanent loss of approximately 394 m^2 of poor semi-improved grassland and marshy grassland habitat within the field east of the M5 motorway, Lodway NSWS, a feature of County/District importance. This equates to approximately 2% of the NSWS. The habitat surrounding the bridleway will be replanted with grassland and the magnitude of impact is minor and significance of effect is **slight adverse**. An additional 0.3 ha of poor semi-improved grassland, marshy grassland and scrub will be temporarily impacted by a haul route during construction for approximately 20-24 months, comprising 15% of the NSWS. This land will be reinstated post construction and the magnitude of impact is minor and significance of effect is **slight adverse**.

Table 9.21: Summary of potential effects on non-statutory designated sites

Designated site	Likelihood of impact
	Temporary indirect impacts from construction, noise, dust and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral.** The effects are considered to be not significant in terms of the EIA Regulations 2017.
Drove Rhyne and adjacent fields NSWS	There is no anticipated direct impact on the feature of County/District importance. Temporary indirect impacts from construction, noise, dust and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral** and considered to be not significant in terms of the EIA Regulations 2017**.**
Fields between railway line and A369, Portbury NSWS	There is no anticipated direct impact on the feature of County/District importance. Temporary indirect impacts from construction, noise, dust and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral** and considered to be not significant in terms of the EIA Regulations 2017**.**
Field east of Court House NSWS	A permanent right of access and turning circle will be required along the northern edge of the field to access the culvert and Cattle Creep bridge from the south during construction. No physical track will be constructed and the access route will be used occasionally by light vehicles. Direct impacts would be occasional damage to herbaceous plants and small shrubs by light vehicles. Temporary indirect impacts on the wider site from construction, noise, dust and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is minor and significance of effect is **slight adverse** and considered to be not significant in terms of the EIA Regulations 2017**.**
Priory Farm (AWT Nature Reserve) Land adjacent to Severn Estuary SSSI (Portbury) NSWS Fields between A369 and M5 Motorway, Portbury NSWS	No anticipated direct impacts. Temporary indirect impacts from construction, noise, dust and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral** and considered to be not significant in terms of the EIA Regulations 2017.

Table 9.21: Summary of potential effects on non-statutory designated sites

Designated site	Likelihood of impact
Fields on Caswell Moor NSWS Fields adjacent to M5 Motorway, Portbury NSWS Lamplighter's Marsh SNCI	
Lamplighter's Open Space BWCS	This feature of County/District importance is situated at a sufficient distance to be unaffected by the DCO Scheme. The magnitude of impact is no change and the significance of the effect is considered to be **neutral** due to the distance from the scheme (>300 m) and considered to be not significant in terms of the EIA Regulations 2017.

Habitats - Woodland and trees

9.6.16 The proposed works will result in the removal of a linear corridor of trees and scrub along the Portishead to Pill section of the railway to facilitate the construction and operational widths of the DCO Scheme. This corridor is functionally important, providing forage and dispersal habitat for a number of species, including barn owls, bats, badgers, amphibians and reptiles and is of Regional importance.

9.6.17 Table 9.22 summaries the approximate areas of recent (secondary) woodland, trees and scrub that will be permanently lost from the Portishead to Pill line. This is for 6 m wide rail track and cess along the route of the Portishead to Pill line (3 m either side of the running rail) and other areas such as Portishead Station car park, Sheepway permanent maintenance compound and the M5 bridleway extension.

9.6.18 A corridor of 3 m from each side of the running rail will be permanently cleared, a further 2 m will be cleared for construction but will be allowed to grow back after construction and will therefore not be permanently lost. These areas are also shown in Table 9.22.

Table 9.22: Approximate areas of habitat loss by habitat type

Habitat type (Phase 1)	Area permanently lost (m^2)	Additional area lost along Portishead to Pill line during construction (m^2)
Semi-natural broadleaved (recent) woodland	9,596	2,968
Scrub	42,992	13,878
Total	**52,588**	**16,846**

9.6.19 The magnitude of impact of loss of woodland and trees is moderate and the significance of the effect is likely to be **long term large adverse,** leading to a likely significant effect in terms of the EIA Regulations 2017 without mitigation.

Habitats - Important hedgerow at Lodway

9.6.20 A section of hedgerow approximately 160 m in length to the east of the M5 Bridge will be removed to allow construction traffic access between the disused line and Lodway construction compound. This hedgerow qualifies as an Important hedgerow under the Hedgerows Regulations 1997. The total length of the Important hedgerow in this area is 226 m and the loss of habitat affects 70% of the hedgerow, a feature of local importance. The magnitude of impact is major and the significance of effect is **long term moderate adverse**, leading to a likely significant effect in terms of the EIA Regulations without mitigation.

Great Crested Newts

9.6.21 The proposed work will not result in the direct loss of GCN breeding ponds, but there will be loss of terrestrial foraging and hibernation habitat along the disused line and the potential to kill and injure GCN during the construction process. There will be no habitat fragmentation as GCN are also known to use and move across railway ballast (Principal Environment and Social Value Manager Network Rail, pers. comm.). If unmitigated, the magnitude of impact of the loss of adult animals, particularly breeding females and the deterioration of terrestrial habitat and hibernation features of district importance, is likely to be moderate. The significance of effect is likely to be **long term moderate adverse,** leading to a likely significant effect in terms of the EIA Regulations 2017.

Other amphibians

9.6.22 The proposed work will not result in the direct loss of common toad breeding ponds, but there will be a loss of terrestrial foraging and hibernating habitat, along with the potential of obstructing a migration route along the railway corridor at Pill and the potential to kill and injure toads during construction. The magnitude of impact on the regionally important population of common toads is moderate and significance of effect is **long-term moderate adverse,** leading to a likely significant effect in terms of the EIA Regulations 2017. Impacts on other amphibians, which are of local importance, are similar to those for GCN above, with no loss of breeding ponds, but loss of terrestrial foraging and hibernation habitat along the railway corridor and the potential for killing and injury during the construction phase. The magnitude of impact is moderate and significance of effect is **long term slight adverse** and not significant in terms of the EIA Regulations 2017.

Badgers

9.6.23 The proposed works will result in the direct loss of badger setts. Foraging and dispersal habitat will also be lost for the duration of the construction period. Disturbance to badgers may also arise from machinery, vibration and noise, together with potential injury and death of badgers.

9.6.24 A draft badger licence application is being prepared. Measures include a pre-construction badger survey, closure of setts and construction of an artificial sett for temporary closure of a main sett. Foraging, disturbance and

dispersal during construction will be mitigated by adherence to the Master CEMP (Appendix 4.2, DCO Document Reference 8.14) by measures such as avoiding excavations being left open overnight, avoiding lighting retained vegetation and avoiding night time working. Temporary fencing will be used to protect retained badger setts from construction impacts. The magnitude of impact on the locally important badger population is moderate and significance of effect is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017.

Bats

9.6.25 **Bat Roosts**. Reopening the disused railway line will include minor repairs to five bridges. Two of these bridges support bat roosts of importance within the immediate zone of influence. A draft bat licence application has been prepared. Standard measures ensure the magnitude of impact is minor and significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

9.6.26 The derelict store near Sheepway on the disused railway line, which is a locally important night roost for horseshoe bats, will be retained and fenced from the operational railway. There may be minor disruption to the use of the derelict store by bats during the construction period when vegetation is cleared but this is temporary, constituting an impact of minor magnitude that is unlikely to have a long term adverse effect, which is assessed as **neutral** significance and not significant in terms of the EIA Regulations 2017.

9.6.27 Trees will need to be removed to allow the construction and operational widths of the rail corridor, but some mature vegetation will be retained to provide visual screening and wildlife habitat. It is anticipated that the majority of trees with moderate or high bat roost potential (of local importance) can be retained because they are on the boundary of NR's land, but there may be partial loss of the tree roost resource if trees need to be removed for access or tree works are required for safety. The Master CEMP (Appendix 4.2, DCO Document Reference 8.14) includes measures to undertake pre-construction surveys and obtain licences if necessary to mitigate for minor impacts on bat roosts to ensure that the significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

9.6.28 **Bats – foraging and commuting habitats**. For horseshoe bats, see paragraphs 9.6.9 – 9.6.13 North Somerset and Mendip Bats SAC. More widespread species such as pipistrelles are likely to be able to adapt more readily to the reduction in the foraging and navigational route by site clearance and the magnitude of impact on these species is minor. The significance of effect is **long term moderate adverse**, leading to a likely significant effect on non-SAC bat species without mitigation.

Birds

9.6.29 Site clearance and vegetation removal has potential to damage or destroy nests from a number of common and passerine birds of local importance. Standard measures to protect breeding birds is included in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14) and the magnitude of impact is considered to be minor, leading to a **neutral** effect which is not significant in terms of the EIA Regulations 2017.

9.6.30 The site and adjacent corridor is known to support forage and breeding habitat for a Schedule 1 bird species namely Barn owl. Portbury Wharf Nature Reserve is a known site for barn owl breeding/activity and a barn owl box at the Reserve is currently located c.200 m from the disused railway. Structures identified with potential for barn owl breeding or roosting in the barn owl survey will not be affected by the construction works and it is anticipated that the majority of trees with low or moderate barn owl roosting potential can be retained because they are on the boundary of NR's land.

9.6.31 One roosting site is approximately 50 m from the construction site access and measures to protect potential disturbance of the barn owl roost will be included in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). This site and other structures and trees identified with barn owl roosting/breeding potential will be surveyed prior to construction works commencing as detailed in the Master CEMP. The magnitude of impact is considered to be moderate, leading to a **slight adverse** effect which is not significant in terms of the EIA Regulations 2017.

9.6.32 Installation of the Sheepway permanent maintenance compound will lead to a permanent loss of 0.1 ha of improved grassland at Portbury Wharf Nature Reserve, which is less than 1% of the improved grassland area, which is unlikely to affect barn owl foraging.

9.6.33 Sheepway construction compound will lead to a temporary loss of 0.6 ha of improved grassland foraging habitat at Portbury Wharf Nature Reserve. The area temporarily lost is 18% of the improved grassland area and 2.8 ha will remain during construction and the land will be reinstated post construction.

9.6.34 Approximately 7.7 ha of barn owl foraging habitat (predominantly improved grassland) at Lodway construction compound will be temporarily lost. There is approximately 160 ha of barn owl foraging habitat which has been identified by the Hawk and Owl Trust in the Pill and Ham Green area to the east of the M5 (Appendix 9.3c Ornithology Report WCA Schedule 1 (DCO Document Reference 6.25), which is a confidential document available to appropriate consultees. The temporary loss of 7.7 ha for Lodway construction compound is approximately 5% of this habitat and the land will be reinstated post construction.

9.6.35 Overall, it is considered that the temporary loss of foraging habitat will be of moderate magnitude leading to a **temporary slight adverse** effect which is not significant in terms of the EIA Regulations 2017.

Reptiles

9.6.36 Construction activities such as site clearance, excavation and the construction of haul routes have the potential to kill and injure reptiles, degrade and fragment habitats and reduce opportunities for hibernation and foraging. The design includes a reptile underpass at Quays Avenue and hibernacula to avoid fragmentation and provide habitat for hibernation as shown on the Environmental Masterplan (DCO Document Reference 2.53). The potential to kill and injure reptiles of District importance is moderate and this is likely to have a **long term moderate adverse** effect to reptiles in the vicinity of the scheme, leading to a likely significant effect in terms of the EIA Regulations 2017 without mitigation.

Otter

9.6.37 There will be a permanent loss of approximately 394 m^2 of poor semi-improved grassland and marshy grassland habitat within the field east of the M5 motorway for the M5 bridleway extension (2% of the habitat suitable for otters). The magnitude of impact is minor and significance of effect on the otter population of district importance is **slight adverse.** There is potential for disturbance from site personnel, security lighting and machinery and entrapment of animals during construction due to a haul road to the east of the M5. This will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is minor and significance of effect is **slight adverse** and not significant in terms of the EIA Regulations 2017.

Invasive non-native plants

9.6.38 The potential spread of Japanese knotweed and any other invasive non-native plant species will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14).

Water voles

9.6.39 The area is of local importance to water voles and evidence of possible water vole presence was found in the Portbury Drain in Portishead. Water bodies identified as suitable habitat for water voles will be surveyed pre-construction and works within the vicinity of these waterbodies will be supervised by an Ecologist as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible leading to a **neutral** effect which is not significant in terms of the EIA Regulations 2017.

Construction Phase

Portbury Freight Line

Designated sites and Ancient woodland – Avon Gorge

9.6.40 The DCO Scheme will require the clearance of woodland and other vegetation within the boundaries of the Avon Gorge Woodlands SAC/SSSI, Leigh Woods NNR, Leigh Woods/Oak Woods Ancient Woodland and Rownham Woods Ancient Woodland. This will lead to habitat loss, loss or damage to rare and important plants and potential for the proliferation and spread of invasive species and pathogens (such as the fungus that causes ash die back). Unmitigated clearance also has the potential to promote the faster re-growth rate of unfavourable species which can out compete the rarer species.

9.6.41 Construction works, including repair of structures and retaining walls, installation of access steps, fencing and telecommunications masts and safety works to rock faces and tunnel portals (rock scaling, rock bolting, catch fences and removal of loose blocks), are required within the *Festuco-Brometalia* dry grasslands, ancient woodland areas of the *Tilio-Acerion* forest, secondary (recent) woodland and scrub. Unmitigated site clearance and construction adjacent to these features have the potential to cause:

- Habitat loss;

- Windthrow to stands of Ancient Woodland trees, 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);
- 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.

9.6.42 Rare whitebeam trees will need to be removed or coppiced due to different aspects of construction work, which is summarised in Table 9.23. The reason for tree removal is given in the table. The impact on rare whitebeam trees and other rare or notable flora from the safety works to rock faces is based on preliminary geo-technical surveys and losses have been predicted. More detail regarding the potential works and assessment is provided in Appendix 9.11 AGVMP (DCO Document Reference 8.12).

Table 9.23: 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

Table 9.23: 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	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 stems	Dangerously overhanging
1 Round-leaved whitebeam	EMI182	Bridge No. 6	Remove	Coppiced, height 2m, girth 3.5cm, 2 stems from 15cm stump. Long known tree	To enable bridge works
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

Table 9.23: 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 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

9.6.43 In total, 27 rare whitebeam trees are affected by the DCO Scheme. The following bullets summarise the impacts on rare Whitebeam.

- Loss of 12 Avon whitebeam, ten of which require removal and two coppiced, of the c 42 known individuals of this rare endemic (IUCN 'Critically Endangered'), which is 29% of the world and SAC population. The magnitude of impact is major and significance of effect on the population of international importance is **very large adverse**.
- Loss of 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 scheme is approximately 1% of the world/SAC population and 10% of the survey population. The magnitude of impact is moderate and significance of effect on the population of international importance is **large adverse**.
- Loss of six Leigh woods whitebeam. There are approximately 300 individuals (world/SAC population) and 184 in the survey area (Network Rail land) and this will impact 2% of the SAC population and 3% of the survey population. The magnitude of impact is minor and significance of effect on the population of national importance is **moderate adverse.**
- Loss of 1 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 scheme is approximately 0.2% of the world population and 2% of the Avon Gorge SAC population. The magnitude of impact is minor and significance of effect on the population of national importance is **moderate adverse.**
- Loss of 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 a flora survey of NR land referred to in Flora Survey Appendix 9.10 Flora Survey: Avon Gorge Woodlands SAC / Avon Gorge SSSI (DCO Document Reference 6.25) (and 33 have been removed by persons unknown since). The loss due to the scheme is approximately 0.6% of the world population and approximately 1% of the survey population. The magnitude of impact is minor and significance of effect on the population of national importance is **moderate adverse.**
- Loss of 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). The magnitude of impact is minor and significance of effect on the population of international importance is **moderate adverse.**

9.6.44 Table 9.24 shows the potential loss of ancient woodland, secondary (recent) woodland and SAC grassland within the Avon Gorge Woodlands SAC from the construction works required for the DCO Scheme e.g. installation of fences and rock bolts to rock faces. More details are provided in Appendix 9.11 AGVMP (DCO Document Reference 8.12).

Table 9.24: Areas of vegetation clearance within the Avon Gorge SAC/SSSI by habitat type

Construction Activity	Semi-natural ancient woodland (m^2)	Secondary (recent) woodland (m^2)	SAC grassland (m^2)
Fences removed/replaced or proposed and new access steps	2494	2225	76
Works to bridges numbers 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) and ramp on rail embankment	106		381
Geotechnical works on NR owned rock faces. Predicted areas.	296		80
Geotechnical works on third party owned rock faces. Predicted areas.	868	390	20
Local rebuild of Retaining Walls at Chainages 122mi 79ch and 122mi 67ch		10	10
Total	**4,002**	**3,280**	**582**

9.6.45 The total approximate area of land under management of NR running through the protected areas of the SSSI and SAC designations is 11.5 ha. The vegetation clearance in Table 9.24 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).

9.6.46 The Avon Gorge Woodlands SAC/SSSI, Leigh Woods NNR, Leigh Woods/Oak woods Ancient Woodland and Rownham Woods Ancient Woodland are of international/national importance and the magnitude of loss of habitat impact is major. Unmitigated, the significance of effect of the proposed works upon the SAC is **long term large adverse,** leading to a likely significant effect in terms of the EIA Regulations 2017.

9.6.47 Two access routes and a site compound are proposed on FC land partly within the Avon Gorge Woodlands SAC for construction works access to third party owned rock faces (General Arrangement Plans DCO Document Reference 2.4). Materials will be taken to the rock face areas by a 4 x 4 vehicle and a trailer. No vegetation clearance or works to upgrade the existing site compound area or access tracks are required for construction works access. The frequency of use of the access tracks is anticipated to be approximately 3 to 4 round trips per day. The magnitude of impact is considered to be no change and significance of effect on the site of international importance is **neutral**.

Grassland

9.6.48 The proposed works will result in habitat loss for construction works such as fencing and geo-technical work on rock faces. The works also present an indirect threat to areas of *Festuco-Brometalia* dry grasslands as discussed in relation to the SAC. SAC grassland adjacent to the River Avon Tow Path may be disturbed and damaged by the use of vehicles using the Tow Path to access structures within the Avon Gorge SAC during construction works. The magnitude of impact on the ecological feature of international importance is minor, leading to a **long term moderate adverse** significance of the effect. Unmitigated, this will lead to a likely significant effect in terms of the EIA Regulations.

Other rare or notable plants within the Avon Gorge

9.6.49 Bristol rock-cress (a WCA Schedule 8 plant) is present on Network Rail rock face ID06, located to the north of Clifton Bridge No. 2 Tunnel (Appendix 9.11, AGVMP, DCO Document Reference 8.12). It has been predicted that an area of 20m^2 where Bristol rock-cress is present will be removed for the potential installation of ten rock bolts. This could result in the partial loss of the nationally important population, leading to a moderate impact. This is considered to lead to a **long term large adverse** effect to Bristol rock-cress, leading to a likely significant effect in terms of the EIA Regulations 2017 without mitigation.

9.6.50 Spiked speedwell and round-headed leek, both statutorily protected Schedule 8 species, should not be directly affected by the DCO Scheme. However, both plants of national importance occur on rocks immediately adjacent to the track, where they could be inadvertently damaged by construction works. Fingered sedge, Bristol rock-cress, Lily of the Valley and Solomon's seal *Polygonatum odoratum* (national importance) have been identified on or close to some of the third party rock faces (Appendix 9.11, AGVMP, DCO Document Reference 8.12). NR has confirmed that these rare species will not be affected by the rock face interventions and will be protected by undertaking an Ecological watching brief. Measures to protect rare plants such as protective fencing and tool box talks to construction staff are included in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is no change leading to a **neutral** effect which is not significant in terms of the EIA Regulations 2017.

9.6.51 Of the other rare plants, only narrow-leaved bittercress (national importance) and pale St John's wort (District/County importance), which occur on the railway ballast and in the cess are directly at risk from construction.

9.6.52 The ballast replacement will remove any narrow-leaved bittercress plants and any seedbank in the ballast, although it is thought that these plants will recolonise because it colonises recently disturbed habitats. The negligible impact will lead to a **short term slight adverse** effect which is not significant in terms of the EIA Regulations 2017.

9.6.53 Pale St John's Wort currently occurs along the edge of the cess north and south of Quarry 3 Bridge, and 11 plants (identified in 2016/2017) may be affected by ballast replacement. Unmitigated, the impact on this species of District/County importance will have a moderate magnitude, leading to a **long term moderate adverse** effect, which is a likely significant effect in terms of the EIA Regulations 2017 without mitigation.

Designated sites – Severn Estuary SAC/SPA/Ramsar

9.6.54 There is a risk of indirect construction impacts on overwintering birds and waterfowl using the Severn Estuary SPA/Ramsar/SSSI. The closest construction works will be temporary diversion of a footpath at Jenny's Meadow, approximately 30 m from the designated site.

9.6.55 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 Construction Plant List, 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 9.25). Vegetation removal is predicted to produce the highest noise level at the SPA boundary of 69 $L_{Aeq,12h}$ dB but will not be continuous and will last for no more than one-two weeks. 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.

Table 9.25: Daytime noise levels at Severn Estuary SPA at closest point to works in Pill

Construction activity	Distance from SPA (m)	Predicted noise level[10] dB $L_{Aeq,12h}$
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 line	77	64
Percussive (hammer) piling at Hardwick Cutting	83	63
Percussive (hammer) piling for Avon Road embankment works	67	60

9.6.56 Temporary indirect impacts from construction, noise, dust and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). It is considered that the magnitude of impact from the proposed DCO Scheme would be negligible, leading to a **slight adverse** effect (not significant in terms of the EIA Regulations 2017) on the Severn Estuary bird population due to the following reasons:

- Wintering bird surveys of the Pill Marshes and the adjacent intertidal section of the River Avon have indicated that the designated species of the European Sites do not occur in significant numbers within the survey area close to the DCO Scheme (i.e. <2% of the estuary populations of redshank and curlew, with no other designated species recorded);
- Those designated species that occurred within the survey area (redshank and curlew) were restricted to the intertidal area, which due to the topography is screened from the DCO Scheme;
- The survey area is currently subject to a range of noise and visual disturbance, including the freight rail traffic, M5 traffic and dog walkers;
- Other waterfowl species recorded during the surveys were predominantly common / widespread species (mainly gulls) that are generally considered to be tolerant of human disturbance.

9.6.57 The Severn Estuary SAC/Ramsar could be directly affected by runoff during construction works. The key water environment receptors within the study area which could potentially be affected by the DCO Scheme either during construction or operation have been identified (see Chapter 17 Water

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

Resources, Drainage and Flood Risk, DCO Document Reference 6.20). The tables in Appendix 17.3 Water Receptors (DCO Document Reference 6.25) summarise the identified water receptors to be assessed. Receptors; Pond 11 and ditches D15, D16 and D17 are located in/close to the SAC/Ramsar habitat. Appendix 17.3 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.

9.6.58 No impact is predicted 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. 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.

9.6.59 The assessment of the potential receptors (ES Chapter 17 Water Resources, Drainage and Flood Risk, DCO Document Reference 6.20, and ES Appendix 17.3, DCO Document Reference 6.25) concludes that they have no hydrological link or are unlikely to receive discharges from railway runoff due to distance from the railway line. The magnitude of the impact is no change and the significance of the effect is considered to be **neutral** and not significant in terms of the EIA Regulations 2017.

Designated sites – North Somerset and Mendip Bats SAC

9.6.60 Indirect impacts on the North Somerset and Mendip Bats SAC have been linked to the DCO Scheme (see paragraphs 9.6.9 and 9.6.13 of this chapter). No additional indirect impacts are expected from the construction works proposed on the Portbury Freight Line.

9.6.61 Indirect construction impacts have been assessed at other designated sites detailed in Table 9.26.

Table 9.26: Assessment of indirect effects on designated sites from the DCO Scheme

Designated Site	Distance from the DCO Scheme	Assessment of effects
Chew Valley SPA	9 km	No indirect impacts on Shoveler. **Neutral** significance**,** not significant in terms of the EIA Regulations 2017**.**
Wye Valley Woodlands SAC	18.5 km	No indirect impacts on bats. **Neutral** significance**,** not significant in terms of the EIA Regulations 2017**.**
Wye Valley and the Forest of Dean Bat Sites SAC	19 km	No indirect impacts on bats. **Neutral** significance**,** not significant in terms of the EIA Regulations 2017**.**
Bath and Bradford on Avon Bats SAC	21 km	No indirect impacts on bats. **Neutral** significance**,** not significant in terms of the EIA Regulations 2017**.**
Mendip Limestone grassland SAC	24 km	No indirect impacts on bats. **Neutral** significance**,** not significant in terms of the EIA Regulations 2017**.**
Mells Valley SAC	24 km	No indirect impacts on bats. **Neutral** significance**,** not significant in terms of the EIA Regulations 2017.
Ashton Court SSSI	50 m	No anticipated direct impact on flora or fauna. Temporary indirect impacts from construction, noise, dust and vibration which will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is no change and significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017**.**
Clifton Down Wood Ancient Woodland	150 m	No indirect impact due to distance and the wood being on the other side of the River Avon from the DCO Scheme. **Neutral** significance**,** not significant in terms of the EIA Regulations 2017**.**

Table 9.26: Assessment of indirect effects on designated sites from the DCO Scheme

Designated Site	Distance from the DCO Scheme	Assessment of effects
Horseshoe Bend Shirehampton SSSI	650 m	No indirect impact due to distance and the SSSI being on the other side of the River Avon from the DCO Scheme. **Neutral** significance**,** not significant in terms of the EIA Regulations 2017**.**

Non-statutory designated sites

9.6.62 Construction impacts to non-statutory sites have been assessed as detailed in Table 9.27 below.

Table 9.27: Construction impacts to non-statutory sites (ordered by distance from the Portbury Freight Line)

Designated site	Assessment of Effects	Approximate distance to the closest point to Portbury Freight Line
Bower Ashton Playing Fields BWCS	**Direct:** An area of 0.7 ha of improved grassland habitat will be temporarily lost from Bower Ashton playing fields BWCS (of County/District importance) due to a construction site compound, however the grassland will be reinstated post construction and the magnitude of impact is minor and the significance of effect is **slight adverse.** **Direct**: An area of 0.36 ha of improved grassland habitat will be permanently lost from Bower Ashton playing fields BWCS due to Clanage Road permanent compound. This area equates to approximately 7% of the total area of the BWCS. The magnitude of impact is minor and the significance of effect is considered to be a **permanent slight adverse.** Temporary indirect impacts from construction, noise, potential pollution, dust and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral.** The effects are not significant in terms of the EIA Regulations 2017.	0 m
River Avon (part of) NSWS and River Avon (part of) SNCI	No anticipated direct impact. Temporary indirect impacts from construction, noise, run off, dust and vibration which will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral,** which is not significant in relation to the EIA Regulations 2017.	0 m

Table 9.27: Construction impacts to non-statutory sites (ordered by distance from the Portbury Freight Line)

Designated site	Assessment of Effects	Approximate distance to the closest point to Portbury Freight Line
Avon Gorge and Leigh Woods NSWS	See Avon Gorge Woodlands SAC paragraphs 9.6.40 – 9.6.53 of this chapter.	0 m
Bower Ashton Allotments BWCS Land between railway line and the River Avon BWCS White City Allotments BWCS Alderman Moore Allotments BWCS Bower Ashton Line BWCS Railway line near Bedminster Down BWCS	No anticipated direct impact. Temporary indirect impacts from construction, noise, dust, potential pollution and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral,** which is not significant in relation to the EIA Regulations 2017.	0 m
Bedminster Down Allotments BWCS Lamplighter's Marsh SNCI Ashton Court Estate NSWS Ilchester Crescent Open Space BWCS Avon Gorge SNCI Land between Hotwell Road and Sion Hill BWCS Cumberland Basin Lock BWCS Kennel Lodge Road Allotments BWCS Land between Sneyd Park and the Portway BWCS Signal Station Allotments and Harbour Wall BWCS	No anticipated direct impact. Temporary indirect impacts from construction, noise, dust, potential pollution and vibration will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral,** which is not significant in relation to the EIA Regulations 2017.	1 - 414 m

Table 9.27: Construction impacts to non-statutory sites (ordered by distance from the Portbury Freight Line)

Designated site	Assessment of Effects	Approximate distance to the closest point to Portbury Freight Line
Sneyd Park SNCI		
Colliter's Brook SNCI		
Land between Windsor Place and The Paragon BWCS		
Clifton and Durdham Downs SNCI		
Cumberland Basin BWCS		
Butterfly Junction BWCS		
River Trym confluence with River Avon BWCS		
Manor Farm Sports Ground and playing fields BWCS		
Malago Valley SNCI		
Cornwallis Gardens BWCS		
Enterprise Allotments BWCS		
Ashton Park School playing fields BWCS		
Land north of Ashton Valley fields BWCS		
Lamplighter's Open Space Bristol BWCS		
City and port of Bristol sports ground BWCS		
Trym Valley SNCI		

Badgers

9.6.63 The proposed works will result in the direct loss of badger setts. Foraging and dispersal habitat will also be lost for the duration of the construction period. Disturbance to badgers may also arise from machinery, vibration and noise, together with potential injury and death of badgers from e.g. entrapment in open excavations.

9.6.64 A draft badger licence application will be prepared. Measures include a pre-construction badger survey and closure of setts. Foraging, disturbance and dispersal during construction will be mitigated by adherence to the Master CEMP (Appendix 4.2, DCO Document Reference 8.14) by measures such as avoiding excavations being left open overnight and avoiding lighting retained vegetation. The magnitude of impact on the locally important badger population is minor and significance of effect is considered to be **neutral** and not significant in terms of the EIA Regulations 2017.

Bats - roosts

9.6.65 Upgrade of the Portbury Freight Line will include remedial work to Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel and Sandstone Tunnel (up to **District** importance). Unmitigated, works have the potential to kill or injure low numbers of crevice dwelling bats and disturb all roosting bats, including lesser horseshoe bats. Disturbance to bats would be greatest during winter when animals are hibernating. The remedial work will not alter the fundamental environmental conditions of the tunnel for roosting bats, but there is a risk of minor change from the loss of crevice features. A draft bat licence application is being prepared. Standard measures ensure the magnitude of impact is negligible and significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

9.6.66 The DCO Scheme includes re-opening Pill station with a single platform on the southern side of the railway. The two arches that are used by horseshoe bats on the northern platform will be retained, but renovation and improvements for the new platform is predicted to deter bats from day roosting because of significant disturbance from construction activities to remove the existing southern platform and install a new replacement platform and pedestrian ramp. Construction lighting may also deter lesser and greater horseshoe bats from using the northern platform arches as a night roost. The Master CEMP (Appendix 4.2, DCO Document Reference 8.14) requires the contractor to install a temporary Heras type of fence with plastic sheeting approximately 1 m from the bat roost along the length of the disused (northern) platform or install the permanent measures to screen the bat roost from construction lighting (see paragraph 9.7.60). A draft bat licence application has been prepared. Standard measures ensure the magnitude of impact is negligible and the significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

9.6.67 Trees will need to be removed to allow construction works, including installation of fences and steps and for remedial works to structures. It is anticipated that the trees identified with bat roost potential will be retained where possible or further surveys undertaken to support a bat licence to remove any roosts before tree felling. These and other trees will have to be checked prior to any tree works as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact on the tree

bat roosts of local importance is negligible and the significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

Bats – navigational route at Pill

9.6.68 The Contractor will install a temporary Heras type of fence with plastic sheeting approximately 1 m from the bat roost along the length of the disused (northern) platform or install the permanent measures to screen the bat navigational route from construction lighting (see Section 9.7.60). The magnitude of impact on the bat navigational route of local importance is negligible and the significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

Birds

9.6.69 Site clearance and vegetation removal has potential to damage or destroy nests from a number of common and passerine birds of local importance. Standard measures to protect breeding birds are included in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14) and the magnitude of impact is considered to be minor, leading to a **neutral** effect which is not significant in terms of the EIA Regulations.

9.6.70 Construction work within the Avon Gorge is within potential Peregrine habitat. Peregrine falcon is listed on Schedule 1 of the WCA and hence protected from disturbance whilst breeding. The potential therefore exists for a breach of relevant legislation. The following measures to protect Peregrine falcon are included in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14):

- Where the undertaking of disturbing construction activities is unavoidable during the breeding season (March to June inclusive), they will be subject to monitoring by the scheme EcCoW to assess likelihood of peregrines (or birds of other species) nesting. The location should be checked by the EcCoW during the period leading up to and during the works, and the behaviour of any birds present assessed.
- At the point where any evidence of nesting behaviour is observed, discussions with Natural England and WCA licence for disturbance to Schedule 1 species would be required.

9.6.71 The magnitude of impact is considered to be minor, leading to a **neutral** effect which is not significant in terms of the EIA Regulations 2017.

Dormice

9.6.72 Construction activities in the wider Avon Gorge woodlands such as vegetation clearance on third party rock faces have the potential to destroy and disturb dormouse nests. During the detailed design stage, the sites will be assessed for dormouse potential and if there is any potential to affect dormice (including disturbance) the Applicant or the Contractor (depending on the programme) will submit and obtain a licence in advance of the licensable activities commencing. Vegetation removal will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14) which specifies that the timing of vegetation removal will avoid the dormouse nesting season and damage to ground where potential dormice nests may be present in the winter will be avoided.

9.6.73 Two access routes and a site compound are proposed on FC land for construction works access (General Arrangement Plan, DCO Document Reference 2.4). Materials will be taken to the rock face areas by a 4 x 4 vehicle and a trailer. No vegetation clearance or works to upgrade the existing site compound area or access tracks are required for construction works access. The frequency of use of the access tracks is anticipated to be twice per day (mobilise and de-mobilise) and will entail approximately 3 to 4 round trips per day. Due to the non-intensive use of the tracks for the construction works and the current use of the access tracks by the FC, no increase in disturbance to dormice is anticipated.

9.6.74 The magnitude of impact on the dormouse population of national importance is considered to be negligible and significance of effect is **slight adverse** and not significant in terms of the EIA Regulations 2017.

Reptiles

9.6.75 The site and adjacent corridor are of district importance for reptiles. Construction activities such as site clearance have the potential to kill and injure reptiles, degrade and fragment habitats and reduce opportunities for hibernation and forage. The potential to kill and injure reptiles of District importance is moderate and this is likely to have a **long term moderate adverse** effect to reptiles in the vicinity of the scheme, leading to a likely significant effect in terms of the EIA Regulations 2017 without mitigation.

Invertebrates

9.6.76 There will be some losses of woodland and grassland habitat used by invertebrates due to vegetation clearance for construction the DCO Scheme. However, extensive areas of suitable habitat will remain. The magnitude of effect on invertebrates of county importance is minor and the significance of the effect is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017.

Otter

9.6.77 Otters may be affected by disturbance from construction noise, lighting and visual impacts. This will be managed as detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). The magnitude of impact is negligible and significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

Operation Phase

Portishead to Pill

Designated sites – North Somerset and Mendip Bats SAC

9.6.78 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, except for any vegetation overhanging the 3 m corridor or which poses a danger to the railway. Natural regeneration beyond the 3 m width 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. Planting undertaken along the railway (Railway

Landscape Plans (disused line) DCO Document Reference 2.10) and infill planting on land owned by NSDC alongside the A369 Portbury Hundred (Appendix 9.16, DCO Document Reference 6.25) will be maintained for 5 years.

9.6.79 The magnitude of impact is considered to be negligible leading to a long term **slight adverse** effect which is not significant in terms of the EIA Regulations 2017.

Designated sites – Severn Estuary SPA/Ramsar

9.6.80 The DCO Scheme may result in increased recreational/tourism disturbance to the Severn Estuary designated site in the operational phase but this is predicted to have a magnitude of impact of no change and significance of effect is neutral, considering the presence of extensive residential and commercial areas nearby.

9.6.81 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 (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), 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 $_{LAeq,16h\ dB(A)}$, to 54 $_{LAeq,16h\ dB(A)}$. 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).

9.6.82 The magnitude of impact on the internationally important sites is no change, leading to a **neutral** effect and not significant in terms of the EIA Regulations 2017.

Non statutory designated sites

9.6.83 The Sheepway permanent maintenance compound at Portbury Wharf Nature Reserve will be used indicatively as follows: approximately twice a month for a van access and once in 12 months for low loader access. It will be used as a van access to undertake routine maintenance (such as track patrolling) and as a rail access for renewals works using machines brought in by low loaders. No storage is planned at this location (other than temporarily for renewals works). It is anticipated that birds and other species at the Portbury Wharf Nature Reserve will quickly habituate to the noise associated with use of the Sheepway permanent maintenance compound and the passage of trains. The operational noise level is predicted to change from the existing level of 51 dB $L_{Aeq,16h}$ to 54dB $L_{Aeq,16h}$ (Chapter 13 Noise and Vibration, DCO Document Reference 6.16). The magnitude of impact on this site of county importance is minor and the significance of effect is considered to be **long term slight adverse** and not significant in terms of the EIA Regulations**.**

9.6.84 An extension of the bridleway is proposed through the field east of the M5 motorway NSWS, of County/District importance. This track will not be lit and will therefore not have any detrimental effect on otters or bats. The magnitude of impact of the operational use of the 2 m wide track is

negligible and the significance of effect is neutral and not significant in relation to the EIA Regulations 2017.

9.6.85 A permanent right of access and turning circle will be required along the northern edge of the field east of Court House NSWS to access the culvert and Cattle Creep bridge from the south during the operational phase of the DCO Scheme. The access route will be used occasionally by light vehicles for inspections. Direct impacts will be occasional damage to herbaceous plants and small shrubs by light vehicles. The magnitude of impact is minor and significance of effect is slight adverse and considered to be not significant in terms of the EIA Regulations 2017.

Badgers

9.6.86 It is likely that badgers will quickly habituate to the increased numbers of trains. However, it is considered likely that once the disused line is in use there will be some collision associated casualties. The magnitude of impact on the locally important badger population is minor and the resulting significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

Bats – navigational route

9.6.87 The DCO Scheme has the potential to adversely affect the functionality of the railway line as a navigational route for bats between Portishead Station and Portbury Junction at Pill, with the impact being greatest for lesser and greater horseshoe bats because these species rely on sheltered flight paths through the landscape. The loss of navigation features is most apparent at the Royal Portbury Docks area due to narrowing of land and crossing the M5. Vegetation within Network Rail land provides screening from operational lighting at Royal Portbury Dock facilities that are on both sides of the railway.

9.6.88 The Supplementary Planning Document related to the North Somerset and Mendip Bats SAC (North Somerset Council, 2018), requires that introduced light levels shall not affect existing features used by SAC bats to above 0.5 lux; or not exceeding baseline light levels where this is not feasible. It is considered that lighting has the greatest 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. The lighting assessment provided in support of the Court House Farm planning application considers the lighting (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-construction in accordance with a planning condition, to ensure anticipated lux levels of <0.5 lux are met.

9.6.89 A lighting survey was undertaken for the DCO Scheme 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, Lighting Survey Report, DCO Document Reference 6.25). 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.

9.6.90 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.

9.6.91 Retained vegetation and planted vegetation may provide enough sheltered flight paths to maintain the navigational route for bats but this is uncertain. The ecological feature is of regional importance and the magnitude of impact is considered to be moderate with a resulting **long term moderate/large adverse effect** (uncertain), leading to a likely significant effect in terms of the EIA regulations 2017 without mitigation.

9.6.92 The DCO Scheme is unlikely to cause significant effects on local bat populations because of the increased collision risk with trains. Although the DCO Scheme will open the disused railway line, the line speed of 75 mph will only be for a short distance due to trains accelerating and decelerating out of the stations at Portishead and Pill. The survey results have shown that the patterns of bat activity within the rail corridor are dispersed. The possibility that trains may kill or injure low numbers of animals cannot be entirely discounted, but the magnitude of the impact is predicted to be negligible and significance of effect on the bat population of regional importance is considered to be **slight adverse** and not significant in relation to the EIA Regulations 2017.

Birds

9.6.93 Bird habitat will re-establish post construction within the railway corridor. Over a 15 year period, compared to the baseline, the magnitude of the effect on the linear corridor is minor adverse due to net loss of some habitat and the significance of the operational effect on the locally important breeding birds, including barn owl is considered to be **neutral** and not significant in terms of the EIA Regulations 2017.

9.6.94 The operational effect on overwintering birds is discussed in Section 9.6.80-9.6.82 of this chapter and is considered to be **neutral** and not significant in terms of the EIA Regulations 2017.

Reptiles and Amphibians

9.6.95 NR maintenance allows for a mosaic habitat of rough grassland, scrub and trees to be present within the railway corridor, which will be suitable for reptiles and great crested newts. Operational impacts on reptiles, GCN and most other amphibians will be no change and the significance of effects are considered to be **neutral** and not significant in terms of the EIA Regulations 2017. Operational impacts on common toad include possible disruption of the toad migration route across the new railway line at Pill, along with potential direct injury and death of individuals. Research has found that railways can cause amphibian mortality and that most dead individuals (77%) were adult common toads. The research suggests that railway mortality depends on the agility of the species, associated primarily with the ability to overcome the rails (Budzik et al, 2014). The magnitude of impact

on common toad is moderate and significance of effect is **moderate adverse** leading to a likely significant effect in terms of the EIA Regulations 2017.

Otter

9.6.96 Operational use of the disused line is unlikely to lead to disturbance of otters using sites close to the line such as Portbury Wharf Nature Reserve due to the service not running through the night (from 12pm to 6am) and limited lighting and only minor change in noise. The magnitude of the impact is minor and the significance of the effect on otters will be **slight adverse** and not significant in terms of the EIA Regulations 2017.

Operation Phase

Portbury Freight Line

Designated sites – Avon Gorge

9.6.97 Operational Impacts on the woodlands of the Avon Gorge include ongoing clearance and removal of woody vegetation within 3 m of the running rail and the area vertically above this. Operational vegetation management is undertaken in line with procedures set out in NR's SMS and VMP (Appendix 9.15, DCO Document Reference 6.25) which specifies that trees will be managed when and where required for the safe operation of the railway, taking account of the SAC and SSSI features and ensuring that they are not negatively affected by these actions. Efforts must first be made to find alternative methods of management (beyond felling) where important species or habitat is highlighted as a risk. For all of the above, if tree felling is undertaken within the SAC or SSSI, consent from Natural England is required, except in emergency situations.

9.6.98 NR's SMS specifies that the eradication of plant species, listed in Schedule 9, Part II of the Wildlife and Countryside Act 1981 and the Weeds Act 1959 will be a priority.

9.6.99 After completion of the actions set out in the current SMS and VMP (Appendix 9.15, DCO Document Reference 6.25) and the activities of MetroWest DCO Scheme, NR will reassess its activities to develop a new SMS. A new SMS will be drafted in 2023 based on an assessment of the Avon Gorge vegetation at the time and will ensure that the vegetation is managed appropriately and in agreement with Natural England.

9.6.100 Operational impacts on NR rock faces and structures such as tunnel portals (where woodland, SAC grassland and rare/notable plants such as Bristol rock-cress is present) will be visual inspections of all rock faces which will be undertaken annually. The rock face interventions have a design life of 60 years and rock bolts will be checked every 10 years and maintenance to the metal components in the rock face will be undertaken every 10 years. Scaling is likely to be required approximately every 10 years (or as and when required depending on results of rock face inspections) and consents for any works will be sought from Natural England prior to commencement and the works undertaken with an ecological watching brief to avoid damage to rare or protected habitats or species.

9.6.101 Similar operational works will be required on third party rock faces.

9.6.102 Chapter 7 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 Woodlands SAC. The assessment considers NO_x concentrations and rates of nitrogen deposition and acid deposition for the (Base Year (2015), Do-Minimum (2021) and Do-Something (2021) scenarios. Total NO_x concentrations and nitrogen and acid 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. The results are presented in Tables 1.3-1.5 in ES Volume 4, Appendix 7.4 (DCO Document Reference 6.25).

9.6.103 The Air Quality Strategy ("AQS") NO_x objective for vegetation and ecosystems is 30 µg m^{-3}, which is the critical level for all vegetation sensitive to nitrogenThe Do-Minimum and Do-Something scenarios predict a negligible change in NO_x concentrations, with the contribution of the scheme at 1% or lower than the critical level and NO_x concentrations at all receptors lower than the objective.

9.6.104 Chapter 7 Air Quality and Greenhouse Gases (DCO Document Reference 6.10) reports data from the Air Pollution Information System ("APIS") website, indicating that the current nitrogen deposition rate for *Tilio-Acerion* forests 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[11]. The current deposition rate for semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia)* 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. Table 1.4 in ES Volume 4, Appendix 7.4 (DCO Document Reference 6.25) shows the nitrogen deposition rates predicted for each scenario at the receptors along both transects extending into the Avon Gorge Woodlands SAC. Nitrogen deposition rates have been compared against the lower end of the range of critical loads for both the woodland and grassland qualifying features of the Avon Gorge Woodlands SAC (15 kg N kg $ha^{-1}y^{-1}$). Predicted nitrogen deposition rates for all scenarios exceed the critical load range (15 to 25 kg N kg ha-$^{1}y^{-1}$) for both qualifying habitats in the SAC in both Base and Opening Year. The scheme contribution is zero for all receptors except the receptor closest to the railway line (R43 at 19m from the scheme), which shows a small increase in deposition rates of 0.1 kg N kg $ha^{-1}y^{-1}$(i.e. 0.7% of the minimum critical load).

9.6.105 Results for acid deposition rates in Table 1.5 of ES Volume 4, Appendix 7.4 (DCO Document Reference 6.25) show that for all receptors and scenarios the minimum critical load of 1.2 $kEqH^{+}$ ha^{-1} yr^{-1} was exceeded. The highest contribution from the DCO Scheme was predicted for receptors 42 and 43 (0.2% and 0.3% of the critical load respectively). All other receptors show imperceptible changes as a result of the DCO Scheme.

9.6.106 The contribution of the DCO scheme to the critical level (for $NO_{x)}$ and critical load (for nitrogen and acid) is 1% or less for all receptors. According to

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

Institute of Air Quality Management ("IAQM") guidance (Holman et al., 2019)[12] for many habitats 1% of the critical load/level lower threshold equates to a very small change within the expected normal variation in nitrogen deposition. Therefore, the magnitude of impact on the internationally important site is negligible and the significance of effect is **long term slight adverse** which is not significant in terms of the EIA Regulations.

Designated sites – River Severn SPA/Ramsar/SSSI/SAC

9.6.107 During operation of the DCO Scheme, no noticeable change in the daily noise exposure level of 59 dB $L_{Aeq,16h}$ at Pill Marshes is predicted (ES Chapter 13 Noise and Vibration, DCO Document Reference 6.16). 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 (ES Chapter 13). 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 very few SPA-qualifying birds.

9.6.108 In Pill, in the areas closest to the Severn Estuary 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}) (Chapter 7 Air Quality and Greenhouse Gases, DCO Document Reference 6.10).

9.6.109 There is no potential for run-off or contamination in drainage from the operational scheme to the Severn Estuary SAC as there are no hydrological linkages.

9.6.110 The magnitude of the impact is no change and the significance of effect is **neutral,** which is not significant in terms of the EIA Regulations 2017.

Non-statutory designated sites

9.6.111 No operational impacts are anticipated on non-statutory designated sites except for Avon Gorge and Leigh Woods NSWS, see Section 9.6.97 - 9.6.106 above.

Woodland and trees

9.6.112 See Section 9.6.97 – 9.6.106 above.

Watercourses

9.6.113 No operational impact is anticipated on the watercourses (no change) and the significance of effect is considered to be **neutral** and not significant in relation to the EIA Regulations 2017. Further information is provided in Chapter 17 Water Resources, Drainage and Flood Risk (DCO Document Reference 6.20).

[12] https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf

Badgers

9.6.114 It is likely that badgers will quickly habituate to the increased numbers of trains. Train speeds will not change compared with the current operation of the freight line. The magnitude of impact is minor and the significance of effect on the feature of local importance is therefore considered to be **neutral** and not significant in terms of the EIA Regulations 2017.

Bats

9.6.115 **Bat Roosts in tunnels.** Upgrade of Portbury Freight Line will result in an increase in the number of trains through tunnels in the Avon Gorge that are used by roosting bats (line speed will remain the same). The increase in frequency of trains through the tunnels will increase levels of disturbance caused by turbulence. Whilst crevice dwelling bats such as *Myotis* species will be relatively protected, lesser horseshoe bats that hang from the tunnel walls are exposed. It is predicted that crevice dwelling bats will continue to use the shelter of Clifton 1, Clifton 2 and Sandstone tunnels, but lesser horseshoe bats may abandon summer roosts and hibernation sites in Clifton Bridge No. 2 Tunnel.

9.6.116 The displacement of lesser horseshoe bats from roosts within Clifton Bridge No. 2 Tunnel (district importance) is predicted to have a minor negative impact on the local population, but given the abundance of potential roost sites in natural features (such as caves) in the Avon Gorge Woodlands SAC/SSSI, it can be predicted with adequate certainty that the impacts will not affect the distribution of bats within their natural range and habitats, or have an adverse effect on the favourable conservation of the species. The minor negative impacts can be offset with the provision of alternative roosts.

9.6.117 There is a low risk of bat fatalities if animals are trapped in the tunnels, but given the size of the tunnels, levels of bat activity and frequency of passing trains, the magnitude of impact is predicted to be negligible. The overall impact on bat roosts is negligible and the significance of effect is **neutral** and not significant in terms of the EIA Regulations 2017.

9.6.118 **Social activity at tunnels.** There may also be disruption to social activity, particularly in autumn when bats are mating. The dark sheltered environment of the tunnels attracts social activity around the portals would be disrupted for a short duration as each train passes. The passenger line will run an hourly or hourly plus service (45 minutes in the peak periods and hourly in the non-peak periods) until midnight. Social activity by bats tends to peak several hours after sunset, when they emerge. Disruption from trains between sunset and midnight affects the early period of nightly bat activity, when bats are typically feeding. The train service is therefore considered to have minor adverse impact on social activity at tunnel portals and a **long-term slight adverse** effect on bat activity and not significant in terms of the EIA Regulations 2017.

9.6.119 **Bat roost at Pill Station Arches.** It is predicted that lesser and greater horseshoe bats will abandon roosts within the arches on the northern platform of Pill Station because of the operational lighting proposals. New lighting columns and luminaires will illuminate the southern platform and highways at the station and Pill Station car park. Without control measures and a suitable lighting plan to retain dark, unlit bat flight lines to the

archways on the northern platform, lesser and greater horseshoe bats will not use the roost sites at Pill Station. There will also be increased disturbance from passengers on the southern platform. The archways are open fronted and their proximity to passenger areas on the platform exposes the roost environment to human disturbance. The magnitude of impact on the bat roost of local importance is major and the significance of effect is considered to be **long term moderate adverse** and is significant with regard to the EIA Regulations 2017.

9.6.120 **Bat Roosts in trees.** Operational Impacts on the woodlands of the Avon Gorge include clearance and removal of woody vegetation within 3 m of the running rail and the area vertically above this (Appendix 9.15, NR's SMS, VMP and HRA DCO Document Reference 6.25). The trackside tree bat roost resource is relatively limited because a large proportion of the woodland is relatively young and is estimated to have developed over the latter part of the twentieth century. This may be a consequence of land management for the freight line, with clearance for track safety and engineering works (such as maintenance of retaining walls). As a result, the bat roost resource is largely associated with ivy cover on trees, and there are very few trees with tree roost features that would support communal bat roosts. Clearance of track side trees within 3 m of the rail will result in a minor negative impact on a tree roost resource of local value. The predicted significance of effect is therefore **neutral** and not significant with regard to the EIA Regulations 2017.

9.6.121 **Bat navigational route at Pill Station**. Operational lighting for Pill Station is likely to affect the navigational route along the freight line used by horseshoe bats. The detailed design of lighting for Pill station platform, steps and access ramps will be completed by NR. The preliminary design indicates that the platform lighting will be 52 lux (average) and 26 lux (minimum) with 5 m high lighting columns. This will result in lighting on the disused (northern) platform where the bat roost is located of 0.65 lux (average) and 1.21 lux (maximum). This will not be compliant with the North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document (North Somerset Council, 2018), which requires that "*introduced light levels will not affect existing and proposed features used by SAC bats to above 0.5 lux; or not exceeding baseline light levels where this is not feasible.*"

9.6.122 The magnitude of impact on the horseshoe bat navigational route of Local importance is major and the significance of effect is considered to be **long term moderate adverse** and is significant with regard to the EIA Regulations 2017.

Birds

9.6.123 Operation of the freight line will not lead to a significant effect on passerine birds due to the small area of habitat affected compared to the habitat available, therefore the magnitude of impact is negligible and the significance of the effect is **neutral** and not significant in terms of the EIA Regulations 2017.

9.6.124 No operational impacts are anticipated on overwintering birds as discussed in Section 9.6.80 – 9.6.82 and the significance of effect is therefore **neutral** and not significant in terms of the EIA Regulations 2017**.**

9.6.125 No operational impacts on peregrine are expected because the birds are very much used to traffic, trains, engineering works, boats, climbers and people using the River Avon Tow Path in the Avon Gorge. Although trains will be more frequent with the passenger service, maximum rail speeds will remain the same (30 mph) through the gorge. The magnitude of impact is negligible and significance of the effect is **neutral** and not significant in terms of the EIA Regulations 2017.

Reptiles

9.6.126 The linear corridor of rough grassland, trees and scrub will remain within the railway corridor. Compared to the baseline, the magnitude of the impact is negligible and the significance of the effects is considered to be **neutral** and not significant in terms of the EIA Regulations 2017.

Invertebrates

9.6.127 Vegetation will be managed along the Portbury Freight Line by NR within 3 m of the running rail. Large areas of suitable habitat will remain. The magnitude of effect on invertebrates is negligible and the significance of the effect is considered to be **neutral** and not significant in terms of the EIA Regulations 2017.

Otter

9.6.128 Operational use of the freight line for a passenger service is unlikely to lead to significant disturbance of otters using sites close to the line such as the River Avon and Ham Green Lakes due to the service not operating at night (12pm to 6am) and limited additional lighting and noise compared to existing disturbance from freight trains, road noise and use of the River Avon Tow Path. The magnitude of the impact is negligible and the significance of the effect on otters will be **neutral** and not significant in terms of the EIA Regulations 2017.

Decommissioning Phase

9.6.129 For the reasons set out at 9.3.12 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 on ecological receptors resulting from decommissioning.

9.7 Mitigation and Residual Effects

Construction Phase

Portishead to Pill

9.7.1 The preceding section identified various effects that are considered to be significant in the absence of ecological mitigation beyond the measures adopted as part of the DCO Scheme. This section identifies ecological mitigation measures and assesses the residual effects for each of those habitats and species for the construction impacts which are considered to lead to a moderate or higher significance of effect.

Designated sites

North Somerset and Mendip Bats SAC

9.7.2 The long term large adverse effect on the navigational route and foraging habitat used by horseshoe bat species linked to the North Somerset and Mendip Bats SAC will be mitigated by retaining as much vegetation as possible and replanting to maintain a vegetated corridor on the Portishead to Pill section, as detailed in the Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10) and Table 9.28. This is also relevant for the moderate adverse effect on the non SAC bat species using the navigational route and the effect on woodland and trees (Sections 9.6.28 and 9.6.16 of this chapter).

9.7.3 The Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10) show 'rail corridor to be clear of vegetation' which is defined as a corridor of 3 m from the running rail which will be permanently clear of vegetation. Another area is shown as 'rail corridor to be clear of vegetation, NR option to clear in future'. This area lies between 3 m and 5 m from the running rail (i.e. a 2 m wide corridor either side of the rail) which will be cleared for construction but where vegetation will be allowed to grow back after construction, except for any vegetation overhanging the 3 m corridor or which poses a danger to the railway.

9.7.4 Vegetation will be retained along the Portishead to Pill 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.

9.7.5 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).

9.7.6 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).

9.7.7 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 from adjacent land 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 (see the 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.

9.7.8 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.

9.7.9 The areas and lengths of retained or replanted woodland and scrub are shown in Table 9.28.

Table 9.28 Area of woodland and scrub retained or replanted Portishead to Pill

Habitat type	Area (m^2)
Retained vegetation	20,962
Woodland planted	2,587
Scrub planted	214
Hedge with trees planted	1,408 (971 metres length)
Hedge no trees planted	1,310 (1,142 metres length)
Total (m^2)	26,481

9.7.10 An area of 20,962 m^2 (2.1 ha) will be retained and 5,519 m^2 (0.55 ha) of woodland and scrub habitat will be replanted along the Portishead to Pill line (26,481 m^2 (2.65 ha) in total). The total permanent losses of woodland and scrub habitat from the DCO Scheme along the Portishead to Pill line is approximately 52,588 m^2 (5.26 ha) (Table 9.29).

9.7.11 Further mitigation by planting vegetation on the Portishead to Pill 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 Appendix 9.16 Portbury Hundred Proposed Tree Planting (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 (Appendix 9.2, Bat Technical Appendix, DCO Document Reference 6.25). Numerous hedgerows link the A369 Portbury Hundred to the Portishead to Pill line through farm land. This planting is in addition to that specified in the Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10) and detailed in Table 9.28.

9.7.12 Planting is also proposed at Portishead car park and highway and Sheepway permanent maintenance compound.

9.7.13 A comparison of construction woodland and scrub losses and gains has been made. These have been categorised into construction losses (between 3 m and 5 m from the running rail i.e. the area shown as 'rail corridor to be clear of vegetation, NR option to clear in future'), construction and permanent losses (6 m wide rail track and cess along the route of the Portishead to Pill line (3 m either side of the running rail) and other areas such as Portishead Station car park, Sheepway permanent maintenance compound and the M5 bridleway extension. These have been compared to the proposed planting for the Portishead to Pill line, Portishead car park and highway, Sheepway permanent maintenance compound and A369 Portbury Hundred is shown in Table 9.29.

Table 9.29: Comparison of vegetation losses and gains woodland and scrub

Habitat type (Phase 1)	Area lost along Portishead to Pill line during construction (3 m – 5 m from running rail) (m^2)	Area permanently lost (6 m wide track and other areas) (m^2)	Proposed planting (m^2) Portishead to Pill line	Proposed planting (m^2) Portishead and Sheepway	Proposed planting (m^2) A369 Portbury Hundred
Woodland or trees	2,968	9,596	2,587	1,969	5,200
Scrub	13,878	42,992	214		
Hedgerow with trees			1408		
Hedgerow no trees			1310	350	
Retained vegetation			20,962	2,759	
Total	**16,846**	**52,588**	**26,481**	**5,078**	**5,200**

9.7.14 The woodland and scrub losses for construction are 69,434 m^2 (6.94 ha), of this the permanent loss is 52,588 m^2 (5.26 ha). A total of 36,759 m^2 (3.6ha) will be retained or replanted.

9.7.15 Although the extent of the railway woodland and scrub habitat will be reduced, its structure and function will remain as a vegetated railway corridor to 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 A369 Portbury Hundred will be improved as a navigational route for bats by in-fill planting.

9.7.16 The M5 bridleway extension will provide an alternative navigational feature for bats under the motorway. The cycle path will go under the M5 at a location similar to the existing route but re-aligned more to the east, towards the River Avon.

9.7.17 The magnitude of the residual impact is negligible and the significance of effect is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017.

Habitats (other than woodland and trees)

All habitats

9.7.18 A comparison of all habitat losses and gains has been made to assess impacts in Table 9.30. Habitat loss and gains have been divided into the categories as described in Section 9.7.13 of this chapter, habitat gain from biodiversity gain/enhancement off site at Sheepway has also been included.

The vegetation losses for construction are 76,551 m^2 (7.66 ha), of this the permanent loss is 58,420 m^2 (5.84 ha). A total of 85,051 m^2 (8.5 ha) will be retained, replanted or enhanced.

Table 9.30: Comparison of vegetation losses and gains all habitat types

Habitat type (Phase 1)	Area lost along Portishead to Pill line during construction (3 m – 5 m from running rail) (m^2)	Area permanently lost (6 m wide track and other areas) (m^2)	Proposed planting (m^2) Portishead to Pill line	Proposed planting (m^2) Portishead and Sheepway	Proposed planting (m^2) A369 Portbury Hundred	Proposed planting (m^2) Sheepway biodiversity gain / enhancement area (approx. areas)
Woodland or trees	2,968	9,596	2,587	1,969	5,200	10,000
Scrub	13,878	42,992	214			10,000
Grassland	677	3,588	4,251	4,041		20,000
Other tall herb and fern	575	1,537				
Swamp	13	642				
Introduced shrub	20	65				
Hedgerow with trees			1408			
Hedgerow no trees			1310	350		
Retained vegetation			20,962	2,759		
Total	**18,131**	**58,420**	**30,732**	**9,119**	**5,200**	**40,000**

Hedgerow Lodway compound

9.7.19 The long term moderate adverse effect on the important hedgerow at Lodway compound will be mitigated by planting with a native woodland mix of species comparable to the current species diversity post construction as shown in the Railway Landscape Plans (Disused Line) (DCO Document Reference 2.10). The magnitude of the residual effect is considered to be moderate on the hedgerow of local importance (due to the time for the new hedgerow to establish) and the significance of the effect is **slight adverse** and not significant in terms of the EIA Regulations 2017.

9.7.20 [Paragraph deleted from revised version].

Fauna

Great crested newts and other amphibians

9.7.21 The long term moderate adverse impact on great crested newts caused by terrestrial habitat loss and potential killing and injury will be mitigated by retaining/replanting habitat along the railway corridor as detailed in paragraph 9.7.8 of this chapter and compensated by funding the strategic creation and management of ponds as part of the DLL in areas where modelling demonstrates a positive outcome for GCN. A newly created pond within the Ecology Park at Portishead was built in 2020 under permitted development rights and counts towards the DLL provision of ponds, as agreed with NE. Physical harm during construction will be avoided by reasonable avoidance measures such as habitat manipulation and destructive searches as detailed in paragraph 9.7.27 reptiles.

9.7.22 A swale and associated vegetation planting will be constructed on the southern side of Portishead station car park which will link to habitats along the Portbury Drain to enhance the quality of and connectivity with surrounding terrestrial habitat.

9.7.23 The installation of four GCN/reptile hibernation features within Network Rail land between Portishead and Pill will be provided in accordance with the Design Manual for Roads and Bridges (“DMRB”) and the Great Crested Newt Mitigation Guidelines (English Nature, 2001).

9.7.24 GCN populations will be protected through developer contributions under the NE’s DLL to create strategic favourable compensatory habitat offsite of the DCO Scheme. The magnitude of the residual effect is considered to be negligible and the significance of the effect is **neutral** and not significant in terms of the EIA Regulations 2017.

9.7.25 The measures detailed above will mitigate impacts on other amphibians except toads. The magnitude of the residual effect on other common amphibians is considered to be negligible and the significance of the effect is **neutral** and not significant in terms of the EIA Regulations 2017. Further mitigation is required during construction for toads at the Lodway Compound and associated section of the new railway line to prevent potential disruption of migration routes, injury and/or death, as detailed in the Reptile and Amphibian Mitigation Strategy (Appendix 9.13, DCO Document Reference 6.25). Mitigation for toads at Lodway compound is as follows:

- Retention of hedgerow habitat where possible.

- Installation of temporary amphibian fencing. Sections of fencing in high volume toad areas will have pitfall traps.
- Assisting and liaising with Pill Toad Patrol with collection of toads during peak migration time (usually over two weeks in February/March) and peak return time (particularly for toadlets) which is usually two weeks in early summer. Pitfall traps will be checked when open and amphibians collected every morning during peak migration time and taken to the safe release site.
- Restricting construction vehicle movements after dark during peak migration times (as detailed above).
- Identify and establish safe release areas containing suitable habitat close to the site compound identified by the Environmental Clerk of Works.
- Contractor method statements, posters/toolbox talks and briefings to ensure good practice in terms of material storage and making staff aware of toad movements on site, as stated in the Master CEMP (DCO Document Reference 8.14).
- Environmental Clerk of Works to monitor the amphibian fencing and toad movement during the construction phase.
- Rescuing toads from the reptile receptor area at Manor Farm that may be trapped by reptile fencing and taking them to a breeding pond at the relevant time.

After mitigation, the magnitude of the residual effect on toads is considered to be negligible and the significance of the effect is **slight adverse** and not significant in terms of the EIA Regulations 2017.

Schedule 1 Bird Species

9.7.26 The barn owl box at Portbury Wharf Nature Reserve, which was located c200 m from the Portishead to Pill line, was moved to a part of the reserve more distant from the DCO Scheme by the National Grid Hinkley Point C Connection project. Measures are considered in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14) to avoid impacts on barn owl. The magnitude of the impact is negligible and the significance of the residual effect is **neutral** and not significant in term of the EIA Regulations 2017.

Reptiles

9.7.27 The moderate adverse effect on reptiles from habitat loss and potential killing and injury will be mitigated by implementation of the Reptile and Amphibian Mitigation Strategy (Appendix 9.13, DCO Document Reference 6.25). Reptiles will be trapped out in four areas where there is no suitable habitat for displacement or numbers of reptiles are high and relocated to the Portishead Ecology Park or a receptor site at Manor Farm, Pill. For the rest of the Portishead to Pill section, reptiles will be displaced by habitat manipulation and destructive searches where possible and encouraged into retained suitable vegetation. The linear corridor of rough grassland, trees and scrub will remain or be replanted within the railway corridor, and will be suitable for reptiles in the longer term. Four reptile hibernacula and one

reptile bank will be built within NR land (Environmental Masterplan DCO Document Reference 2.53). With this mitigation in place, the magnitude of impact on reptiles is minor and the residual effect is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017.

Construction Phase

Portbury Freight Line

Designated sites

Avon Gorge Woodlands SAC/SSSSI – woodland management

9.7.28 Mitigation for the long term large adverse impact on the Avon Gorge Woodlands SAC, Avon Gorge SSSI, Leigh Woods NNR/Ancient woodland, Avon Gorge and Leigh Woods NSWS, tunnels and SAC grassland will be undertaken by positive management in other areas of SAC habitat as detailed in the AGVMP (Appendix 9.11, DCO Document Reference 8.12). The management on NR land focuses on vegetation management to benefit rare Whitebeam trees in particular by removal of vegetation surrounding Whitebeam trees, particularly invasive non-native species. 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 Underbridge, Underbridge No. 6 and NR rock faces.

9.7.29 The areas identified for such management are twice the size of the areas lost. The total area of vegetation losses is 0.79 ha and the total area where positive management will be undertaken is 1.6 ha.

9.7.30 The AGVMP has also considered providing potential compensation for impacts on the woodland by positive management on FC managed land outside of the Avon Gorge SAC/SSSI as an alternative to providing compensation on 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. However, 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.

Avon Gorge Woodlands SAC/SSSI – whitebeam planting

9.7.31 To replace the lost rare whitebeam, fruits of Avon whitebeam, Bristol whitebeam, Round-leaved whitebeam and Leigh Woods whitebeam, collected by rare whitebeam experts in the Autumn of 2016 have been grown onto sapling stage at Paignton Zoological Gardens (Appendix 9.11, AGVMP DCO Document Reference 8.12). A second collection of rare whitebeam fruits of Avon whitebeam, Bristol whitebeam, Grey-leaved whitebeam and Wilmott's whitebeam was undertaken in September 2018 and sent to Paignton Zoological Gardens for growing.

9.7.32 At the end of 2019, 72 rare Whitebeam trees 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 for planting. Another seed collection was undertaken by rare whitebeam experts in October 2019 for propagation. Collection of hardwood cuttings from Avon whitebeam trees was also undertaken for propagation.

9.7.33 Proposals for whitebeam planting were submitted as part of the DCO application (AGVMP, DCO Document Reference 8.12). Following consultations with NE, FC and NR and further site investigations and assessments, the planting proposals are now presented as two packages, with the first package comprising the original planting sites detailed in Annex H of the AGVMP DCO submission, with minor modifications, and an alternative second package that proposes the addition of a new planting site, on FC land, instead of some habitat management measures on NR land (AGVMP, DCO Document Reference 8.12).

9.7.34 Rare whitebeam saplings will be planted at three of the four locations, three of them on land owned by NR, and one site owned by FC, within the Avon Gorge, depending upon which planting proposal is implemented. The NR sites are the east-facing embankments at Nightingale Valley, the embankment north of Miles Dock Bridge and above Clifton Bridge No. 2 Tunnel southern end. The FC site is the red oak plantation bounded by the railway and Sandstone Tunnel (AGVMP, DCO Document Reference 8.12).

9.7.35 The first planting site is at the east-facing embankments between the freight line and River Avon Tow Path at Nightingale Valley (Site 1a). If Package 1 is undertaken, of the 75 tree saplings currently grown, three Avon Whitebeams, two Leigh Woods whitebeams and three Bristol whitebeam saplings will be planted. If Package 2 is undertaken, there will be no planting at this site.

9.7.36 Site 1b is also on the east-facing embankment between the freight line and River Avon Tow Path at Nightingale Valley, north of Valley Bridge. Under Package 1, four Bristol whitebeams and 11 Leigh Woods whitebeam saplings will be planted at Nightingale Valley Site 1b. Under Package 2, the proposals are for three Avon whitebeams and 12 Leigh Woods whitebeams.

9.7.37 The second planting site is on the embankment between the freight line and the River Avon Tow Path north of Miles Dock Bridge (Site 2). If Package 1 is undertaken, it is proposed to plant 26 of the round-leaved whitebeam saplings at the site. If Package 2 is undertaken, there will be no planting at this site.

9.7.38 The third planting site is on land above Clifton Bridge No. 2 Tunnel, southern end (Site 3). This is a small site and is suitable for planting five Whitebeams; two Wilmott's whitebeam, one grey-leaved whitebeam, and two Avon whitebeam saplings will be planted at this location. Planting is proposed at Site 3 for Package 1 and Package 2.

9.7.39 The fourth planting site, located on FC land, is an area of red oak plantation over sandstone bounded by the railway and Sandstone Tunnel (Site 4). Of the 75 tree saplings currently grown, seven Bristol whitebeam and 27 Round-leaved whitebeam are planned within the red oak plantation. Planting is proposed at Site 4 for Package 2 only.

9.7.40 The planting will be carried out and monitored as follows.

- Appendix 9.11 AGVMP (DCO Document Reference 8.12) details the vegetation currently present, % clearance proposed and the existing trees of interest such as small leaved lime and rare whitebeam.
- The planting sites on the embankments are secondary (recent) semi-natural, broadleaved woodland, a feature also cited in the SSSI schedule. However, none of the rare and scarce plants cited in the schedule will be affected, and the rare whitebeams at Site 1a Nightingale Valley (Avon whitebeam) and Site 3 above Clifton Bridge No. 2 Tunnel (Avon whitebeam, Bristol whitebeam and observatory whitebeam, *Sorbus. cf. spectans*) will be carefully avoided. Ancient woodland trees (small-leaved lime, field maple, whitebeam and wych elm) will be retained when clearing sites for planting whitebeams.
- Though located within the SAC, the red oak plantation is not a vegetation type protected within the Avon Gorge Woodlands SSSI or SAC, and the replacement by a more sympathetic hazel and small-leaved lime woodland with the whitebeams on the acidic sandstone soils will enhance the range of woodlands.
- Rare whitebeam tree saplings will be grown on until at least 3 years old and will be planted out at the end of the construction phase using standard methods and tree guards to protect from browsing. A planting and tree maintenance method statement is set out in Appendix 9.11.
- A maintenance and monitoring plan is set out in Appendix 9.11 AGVMP (DCO Document Reference 8.12). This will be undertaken for 10 years after the initial planting by a specialist contractor under the plan.

9.7.41 Proposed planting at three of the four sites as part of Package 1 or Package 2 are shown in Table 9.31. The number and species planted will be reviewed if more saplings are available prior to planting, especially for Avon whitebeam. Only five saplings have grown from seed at the end of 2019 and this assessment indicates that 12 will be removed or coppiced so it would be preferable to plant more Avon whitebeam at Nightingale Valley and Clifton Bridge No. 2 Tunnel (south) sites if more saplings are available.

9.7.42 The ratio of planting to number of rare whitebeam lost is 2:1. Replanting of any saplings that have died for 10 years after the initial planting will be undertaken if saplings are available from stock grown from seed (Appendix 9.11, AGVMP, DCO Document Reference 8.12). Propagation of new stock will continue during the 10 year maintenance and monitoring period.

Table 9.31: Proposed planting of rare whitebeam saplings

Package 1	**Number affected by the DCO Scheme**	**Planting Site 1a**	**Planting Site 1b**	**Planting Site 2**	**Planting Site 3**	**Planting Site 4**	**Total planting**
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	**Number affected by the DCO Scheme**	**Planting Site 1a**	**Planting Site 1b**	**Planting Site 2**	**Planting Site 3**	**Planting Site 4**	**Total planting**
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**

Avon Gorge Woodlands SAC/SSSI – Rare Plants

9.7.43 An area of 20 m^2 of Bristol rock-cress may be removed for installation of rock bolts at NR rock face ID06 (north of Clifton Bridge No. 2 Tunnel). Consent for the removal of the plant, which is protected under Schedule 8 of the WCA (as amended), will be obtained from Natural England prior to works commencing.

9.7.44 A strategy to mitigate and compensate for the potential impacts on Bristol rock-cress is included in Appendix 9.11, AGVMP, DCO Document Reference 8.12. The aim of the conservation strategy is to replace any potentially affected Bristol rock-cress plants with at least twice as many and maintain the larger population. The strategy will involve the following activities:

- Plants will be avoided during the geotechnical stabilisation works by careful siting of rock bolts where possible.
- Surveys of affected plants and soils will be carried out prior to construction to define the scale of the mitigation programme, and plans and contracts put in place prior to any plants being removed.
- If possible, seed will be collected in the months of June or July prior to construction.
- Any potentially affected plants will be collected together with existing soils prior to, or during, site clearance, preferably in autumn or spring prior to the geotechnical works. Transplanted plants will be grown in a botanic garden with a view to replacing them in the wild, or harvesting seed from them for reintroduction.
- The original plants and plants grown from seed will be replanted in appropriate microhabitats in the Avon Gorge at NR rockface ID06 and in Quarry 1 on the rock face adjacent to the railway (both sites on NR land).
- Monitoring will be carried out twice a year for two years after initial planting (year 1), then annually for another 3 years then every two years up to 9 years after initial planting.
- Positive management by clearance of invasive non-native species such as holm oak and cotoneaster is proposed on NR rock face ID06 (where Bristol rock-cress is located) in a 420 m^2 area of SAC grassland, which will benefit Bristol rock-cress in the short term.

9.7.45 Pale St John's Wort, a species of County/District importance, present along the edge of the cess north and south of Quarry 3 bridge on the Portbury Freight Line, will be translocated from the cess to safe areas suitable for this species identified by a plant specialist. Rare plants present on areas where construction works are not taking place such as the rock faces and the River Avon Tow Path will be fenced off to prevent inadvertent damage.

9.7.46 Rare plants such as spring cinquefoil and SAC grassland is 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 frequency of use by vehicles is not confirmed at this stage but it is estimated that it will be approximately three to four times a day. Access will be limited and areas of rare plants and SAC

grassland protected by fencing to prevent accidental damage, as specified in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14).

9.7.47 Following mitigation, the magnitude of impact is negligible and the residual effect is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017.

Avon Gorge Woodlands SAC/SSSI – Potential further mitigation during detailed design

9.7.48 NR may be able to reduce the amount of new and replacement fencing within the Avon Gorge, subject to detailed design. This would reduce the amount of vegetation to be removed for fence installation.

9.7.49 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. Impacts on rare whitebeam trees and Bristol rock-cress, in particular, have been assessed by a realistic worse-case scenario described in Appendix 9.11 AGVMP (DCO Document Reference 8.12). Impacts could be potentially reduced by the following actions:

- Avoid low numbers of rare whitebeam on NR rock face ID05 by careful siting of rock bolts.
- Avoid impacts on Bristol rock-cress on NR rock face ID06 from rock bolt installation by avoiding individual plants or installing a rock catch fence at the bottom of the rock face instead.
- Avoid impacts on high numbers of rare whitebeam on NR rock face ID09 from rock bolt installation by avoiding individual trees or installing a rock catch fence at the bottom of the rock face instead.
- Avoid siting the rock catch fence on third party rock face Area 2 where Avon whitebeams are present.
- Combine the boundary fence and rock catch fence at third party rock face Area 7.

Fauna

Schedule 1 Bird Species

9.7.50 Works within the Avon Gorge and near the M5 Avonmouth Bridge are within potential peregrine habitat. The locations of potential nest sites identified are confidential and details available to appropriate consultees. Mitigation during construction works at the potential nest sites is as follows:

- Where the undertaking of disturbing construction activities is unavoidable during the breeding season (March to June inclusive), they will be subject to monitoring by the scheme EcCoW to assess likelihood of peregrines (or birds of other species) nesting. The location should be checked by the EcCoW during the period leading up to and during the works, and the behaviour of any birds present assessed.

- At the point where any evidence of nesting behaviour is observed, discussions with Natural England and WCA licence for disturbance to Schedule 1 species would be required.

9.7.51 Mitigation measures are possible to avoid impacts on peregrine and it is considered that with the above measures in place the magnitude of the impact is negligible and the significance of the residual effect is **neutral** and not significant in term of the EIA Regulations 2017.

Reptiles

9.7.52 The moderate adverse effect on reptiles from habitat loss and potential killing and injury will be mitigated by implementation of the Reptile and Amphibian Mitigation Strategy (Appendix 9.13, DCO Document Reference 6.25). Reptiles will be trapped out in two areas where there is no suitable habitat for displacement or numbers of reptiles are high and relocated to a receptor site at Manor Farm, Pill. For some other areas of the Portbury Freight line, reptiles will be displaced by habitat manipulation and destructive search where possible into retained suitable vegetation. The linear corridor of ephemeral vegetation, trees and scrub will remain and will be suitable for reptiles in the longer term and one reptile hibernacula will be built within NR land (Environmental Masterplan DCO Document Reference 2.53). The magnitude of impact is minor and the residual effect is considered to be **neutral** and not significant in terms of the EIA Regulations 2017.

Operational Phase

Portishead to Pill

Amphibians

9.7.53 The moderate adverse effect on the Regionally important common toad population from disruption of a migration route and potential killing and injury of individuals between the M5 motorway bridge and Portbury Junction in Pill will be mitigated by implementation of the Reptile and Amphibian Mitigation Strategy (Appendix 9.13, DCO Document Reference 6.25). The mitigation has focused on infrastructure to provide a gap underneath the rails and some form of ‘stopper’ on the rail to force toads following the rail to jump into the gap, which will assist them to cross under the rails. Network Rail is considering adopting hollow concrete sleepers, normally used as under track crossing (“UTX”) for cables, or other similar infrastructure (to be confirmed by NR). The gap in the sleepers is considered suitable for the movement of toads, to assist them to cross the operational line in relative safety. This innovative use of hollow sleepers or other similar infrastructure could be used every 20-50 m, depending upon rail safety.

9.7.54 However, due to the uncertainty of effectiveness of the novel design, two assessments have been undertaken. If toads continue to cross the operational line without injury the magnitude of impact will be negligible and the residual effect is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017. If there is some measurable change in the ability of toads to cross the line or they are subject to killing or injury the magnitude of impact will be minor and the residual effect is considered to be **moderate adverse (uncertain),** leading to a likely significant effect in terms

of the EIA Regulations 2017. The infrastructure and migration will be monitored during the toad migration season following the railway opening. As this is a novel design in the UK, the design and monitoring results will provide useful information to inform other projects.

9.7.55 The two assessments are based on the toad population being of Regional importance as a worst case scenario. As discussed in paragraph 9.4.25, the counts used to inform the assessment of Regional importance could be over-estimates of population size and there is evidence that an assessment of District importance would also be considered reasonable. In this case, the residual effect would be slight adverse or neutral and not significant in terms of the EIA Regulations 2017.

Portbury Freight Line

9.7.56 **Bat Roost at Pill Station Arches and navigational route through Pill**. Operational lighting at Pill Station is likely to lead to lesser and greater horseshoe bats abandoning the roost due to intensive lighting affecting commuting routes to and from the roost. It is also thought that the freight line, particularly between Pill Viaduct and Avon Road, is an important navigational route for horseshoe bats due to this being a sheltered corridor. Lighting will deter horseshoe bats from navigating along the freight line at Pill Station, leading to a moderate adverse effect.

9.7.57 To retain the roost resource in arches 1 and 2 when Pill Station is reopened, a door with dedicated bat access will be fitted to Arch 1 and Arch 2 will be partially covered, retaining the bat access.

9.7.58 The highway and Pill Station car park lighting will be modified with louvres to reduce light spill and avoid impacts on the bat roost and navigational route, with lux lighting levels of 0.5 lux predicted. The preliminary lighting design is shown in Appendix 9.18 Lux lighting plans for Pill Station car park and highways (DCO Document Reference 6.25).

9.7.59 The baseline light levels at Pill Station were surveyed in July 2019 (Appendix 9.17, Lighting Survey Report DCO Document Reference 6.25). A light level of 0 lux was recorded and therefore to comply with the North Somerset and Mendip Bats SAC Guidance on Development: Supplementary Planning Document (North Somerset Council, 2018) introduced light levels should not be above 0.5 lux (rather than baseline). The preliminary design for the platform lighting was reviewed and mitigation by use of a permanent screen built on the disused platform with a minimum height of 1 m, located approximately 1.5 m from the front of the disused platform and 1 m from the back of the platform and Pill Station Arches bat roost was modelled. The resulting lux lighting level behind the permanent screen at 0.5 m high was 0.32 lux (average) and 0.5 lux (maximum). This is considered to be suitable mitigation to allow horseshoe bats to continue to navigate along the disused platform.

9.7.60 The permanent screen will mitigate the impacts of operational lighting on Pill Station Arches bat roost and the bat navigational route at Pill Station. The navigational route on the northern side of the railway corridor will be shielded from light by the screen and vegetation on the embankment in this area will remain, providing a sheltered navigational route with light levels of

0.5 lux or less for horseshoe bats. An alternative to the permanent screen would be to modify the lighting design for Pill Station platform, steps and ramp and NR will consider this option during the detailed design stage for the DCO Scheme.

9.7.61 The residual magnitude of impact is considered to be minor leading to a long term **slight adverse effect** which is not significant in terms of the EIA Regulations 2017.

9.8 Cumulative Effects

Other Projects

9.8.1 Eight other projects are considered to have potential to lead to adverse cumulative effects, as detailed in Appendix 18.2 (DCO Document Reference 6.25). These are summarised below.

- National Grid Hinkley Point C Connection, which may lead to a moderate adverse effect due to crossing the Portishead to Pill line and impacts on Portbury Wharf Nature Reserve. 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. Mitigation is included in the National Grid DCO Scheme and mitigation for the Portishead Branch Line DCO Scheme has taken into account cumulative effects when choosing locations for ecological mitigation. Also, the minimum land take has been designed for Sheepway permanent maintenance compound. With mitigation implemented for both schemes, the residual effect is **neutral** and not significant in terms of the EIA Regulations 2017.
- Application reference 16/P/2066/F, land off Serbert Road, Portishead for 93 residential apartments and office floor space with associated car parking, landscaping and servicing. Great crested newt habitat will be lost. Granted on 09/08/17. Construction programme unknown but expected to be complete before DCO Scheme construction starts. The cumulative impacts will be considered in the great crested newt licence. Habitat will be created as part of the DCO Scheme and the residual effect is slight adverse and not significant in terms of the EIA Regulations 2017.
- Application reference 16/P/1987/F, for storage of vehicles and associated infrastructure, including a crossing over the disused railway between the current Royal Portbury Dock estate and land at Court House Farm, Marsh Lane, Easton-in-Gordano. This development has been built except for a bridge over the Portishead to Pill line. The planning application included proposals to maintain a dark corridor along the railway for bats, through the design of lighting in the new cargo storage areas to the south of the railway and planting a new hedge along the railway boundary. The lighting assessment provided in support of the Court House Farm planning application predicted that the lighting (lux) levels would average <0.5 lux along the railway corridor during the operation of the development and should improve or at a minimum equal the pre-development light levels. Lighting (lux) levels were to be

monitored post-construction by the applicant in accordance with a planning condition, to ensure predicted lux levels of <0.5 lux are met. There is the potential for in-combination effects, as a result of increased lighting levels along the railway corridor from the port's new cargo storage areas and the DCO Scheme. A lighting survey along the disused railway by Court House Farm was undertaken by NSDC in July 2019 to determine the lighting levels post construction (but before the construction of the bridge). The results are shown in the Lighting Survey report (ES Appendix 9.17, DCO Document Reference 6.25). 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. A cumulative **slight adverse** effect is anticipated, which is not significant in terms of the EIA Regulations 2017.

- 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. 18/02847/FB Granted 31/05/2019. PT18/2505/R3F. Deemed Consent 26/04/2019. This scheme is located northwest of Bristol, adjacent to the Severn Estuary and between the mouth of the River Avon and Aust cliffs. 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 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. A cumulative **neutral** effect is anticipated, which is not significant in terms of the EIA Regulations 2017.
- Application reference 18/P/4072/EA1, 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. 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. Vehicular access will be from the 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 CEMP to manage construction impacts, retention of species rich hedgerows and a buffer between the development and ancient woodland on the boundary. A cumulative **neutral** effect is anticipated, which is not significant in terms of the EIA Regulations 2017.
- Application reference 17/01878/F, the demolition and erection of a replacement indoor recreational centre (and car park) on Clanage Road, Bristol. Mitigation within the DCO Scheme includes planting to the north

and south of Clanage Road compound and a cumulative **slight adverse** effect is anticipated which is not significant in terms of the EIA Regulations 2017.

- West of England Joint Spatial Plan and Transport Study – Draft Strategy. There are potential adverse cumulative effects on ecology due to habitat loss. However, limited information is available for the schemes within the strategy and the significance and nature of the cumulative effects are currently unknown.
- West of England Joint Local Transport Plan 4 (JLTP4) – Draft Policy. 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. A cumulative **neutral** effect is anticipated, which is not significant in terms of the EIA Regulations 2017.

Other Works for MetroWest Phase 1

9.8.2 Other elements of MetroWest Phase 1, namely the modifications for Parson Street Junction (including Liberty Lane Sidings), Parson Street Station, Bedminster Down Relief Line, Severn Beach / Avonmouth Signalling and Bathampton Turnback comprise small scale works, confined within the existing railway land. These works to facilitate increased services on the Severn Beach / Avonmouth line have been completed under NR's permitted development rights as part of the Filton Four Track project and the new services are expected to be commissioned in early 2020s. The remaining schemes will also be undertaken by NR under their permitted development rights and do not form part of the DCO application.

9.8.3 The management and control process used by NR for delivering projects that enhance or renew the operational railway is called GRIP. The GRIP process provides assurance that a project can successfully progress to the next stage and requires the preparation of reports for each GRIP stage. Environmental studies are undertaken as part of the GRIP process to identify potential issues and capture the need for mitigation during design and construction. The environmental reports are carried forward from options and feasibility design (GRIP 3 and 4), into the detailed design phase (GRIP 5) and construction (GRIP 6). In this way, environmental issues and mitigation measures are identified at an early stage and addressed through the design and construction phases. Consequently, while permitted development works do not require statutory EIA, the GRIP process provides an internal, non-statutory EIA process.

9.8.4 Liberty Lane Freight Depot (MetroWest Phase 1): A buffer stop and trap points are required at the depot entrance, within the sidings to enable the continuation of the existing freight train shunting movements from the depot across Parson Street Junction onto the Up Relief Line. These works are

within NR's operational boundary and will be implemented using their general permitted development rights. These works must be completed before the Portishead Branch Line DCO Scheme starts operating.

9.8.5 Parson Street Junction (MetroWest Phase 1): Part of the existing junction (switches and turnouts) needs to be renewed, which entails replacement of the track across the junction, replacement of signalling equipment and associated works. These works are within NR's operational boundary and will be implemented using its general permitted development rights. These works must be completed before the DCO Scheme starts operating.

9.8.6 Parson Street Station (MetroWest Phase 1): Minor platform works are required to use platform 3, including adjustment to the platform copers, works to improve track drainage and associated works. These works are within NR's operational boundary and will be implemented using its general permitted development rights. These works must be completed before the DCO Scheme starts operating.

9.8.7 Bedminster Down Relief Line (MetroWest Phase 1): The Down Carriage Line running from Bristol Temple Meads will be extended past Bedminster station to a new turnout on to the Down Main between Bedminster Station and Parson Street Station. The new turnout is required to enable freight trains returning to Royal Portbury Dock to be held in the southbound direction, allowing passenger trains to pass. The works will include the construction of a new turnout, renewal of approximately 1 km of track on the Down Carriage Line and associated signalling. These works are within NR's operational boundary and will be implemented using its general permitted development rights. These works must be completed before the DCO Scheme starts operating.

9.8.8 Severn Beach / Avonmouth Signalling (MetroWest Phase 1): Minor signalling works are required to enable a longer layover period for passenger trains at Avonmouth station and Severn Beach station. These works are not required for the operation of the DCO Scheme.

9.8.9 Bathampton Turnback (MetroWest Phase 1). The Bathampton Turnback will comprise a new turnout between the existing Up line to London and the Down line to Bristol. A short walkway (unsurfaced path) will be provided on the existing Up loop for train drivers to walk from one end of a train to the other end. All the works will be confined to NR's existing land holding and will be undertaken by NR under its General Permitted Development rights. These works are not required for the operation of the DCO Scheme.

9.8.10 Bath and Bradford-on-Avon Bats SAC is located 1.2 km away from the works at Bathampton. A scheme-wide Report to Inform HRA (Appendix 9.12, DCO Document Reference 5.5) considers the impacts to the SAC, however the proposed works will not impact habitat features associated with the SAC.

9.8.11 Given the small-scale nature of these works and the distances between these projects and the DCO Scheme, it is considered that there are no significant cumulative effects during the construction and operation of these projects on habitats, flora and fauna. Consequently, these works have been scoped out of further cumulative impact assessment for the DCO Scheme.

9.9 Limitations Encountered in Compiling the ES

9.9.1 Some detailed aspects of the DCO Scheme design will not be known until the appointment of the contractor, following the grant of the DCO, such as the construction methodology and the schedule of works. Some of the mitigation is dependent on certain works being undertaken at the appropriate time of the year and this is detailed in the Master CEMP (Appendix 4.2, DCO Document Reference 8.14). However, the assessment has taken these limitations into consideration and they do not affect the predictions made.

9.10 Summary

9.10.1 Table 9.32 sets out the potential construction and operational impacts and effects on the resources and features that have been identified.

9.10.2 Overall, the ecological impact assessment completed to date indicates that the DCO Scheme, if unmitigated, will have a significant effect on some ecology and biodiversity features with respect to the EIA Regulations 2017, particularly on horseshoe bats from the North Somerset and Mendip Bats SAC foraging /commuting along the Portishead to Pill section, the corridor of woodland and trees along the Portishead to Pill section, the horseshoe bat roost at Pill Station Arches, the horseshoe bat navigational route at Pill Station, toad migration route at Pill and the Avon Gorge Woodlands SAC.

9.10.3 Measures to mitigate likely significant adverse effects and, as appropriate, effects of lesser significance have been identified and mitigation and compensation measures have been developed.

9.10.4 Mitigation by retaining as much vegetation as possible and undertaking new planting on the Portishead to Pill section and infill planting within land owned by NSDC alongside the A369 Portbury Hundred will be undertaken. This will mitigate for the partial loss of woodland, trees and scrub on the Portishead to Pill section used as a navigational route by horseshoe bats, linked to the North Somerset and Mendip Bats SAC. The residual effect on the ecological feature of regional importance is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017.

9.10.5 Operational impacts on the toad migration route at Pill will be mitigated by installing infrastructure (design to be confirmed by NR) to provide a gap underneath the rails and some form of ‘stopper’ on the rail to force toads following the rail to jump into the gap, which will assist them to cross under the rails. This is a novel design in the UK. If toads continue to cross the operational line without injury the magnitude of impact will be negligible and the residual effect is considered to be slight adverse and not significant in terms of the EIA Regulations 2017. If toads are prevented from crossing the line or are subject to killing or injury the magnitude of impact will be minor and the residual effect is considered to be moderate adverse (uncertain), leading to a likely significant effect in terms of the EIA Regulations 2017.

9.10.6 The Report to Inform HRA (Appendix 9.12, DCO Document Reference 5.5) has identified mitigation measures that address some effects on the Avon Gorge Woodlands SAC and compensation by positive management of areas of the SAC within NR’s ownership affected by invasive non-native species and scrub (or on FC land outside of the Avon Gorge Woodlands

SAC as an alternative) and planting rare whitebeam trees is proposed. Following mitigation, the magnitude of impact is negligible and the residual effect is considered to be **slight adverse** and not significant in terms of the EIA Regulations 2017.

9.10.7 The residual effects are not significant for all other ecological features.

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
Construction activities Portishead to Pill				
Site clearance, loss of habitat including felling of trees along the disused section. Fragmentation of habitat.	North Somerset and Mendip bats SAC **Importance: International**	Partial loss of bat navigational route and foraging habitat. **Magnitude: Moderate** **Significance of effect: Large adverse, likely significant effect**	Retain as much vegetation as possible and replanting vegetation to maintain the navigational route for bats on the Portishead to Pill Section and infill planting on land owned by NSDC on the Portbury Hundred. Railway Landscape Plans (Disused Line) DCO Document Reference 2.10 Appendix 9.16 The Portbury Hundred Proposed Tree Planting (DCO Document Reference 6.25)	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant but Uncertain.**
	Portbury Wharf Nature Reserve **Importance: County**	Temporary loss of approximately 0.6 ha (1.3%) of Nature Reserve habitat for construction compound.	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
Designed to minimise impacts by e.g. minimal land take from designated sites. Design includes underpass at Quays Avenue. CoCP and Master CEMP to require the contractor to include procedures including pre-construction surveys. Draft licences for badgers and bats.		Permanent loss of 0.1 ha (1%) of Nature Reserve habitat for Sheepway permanent compound **Magnitude: Negligible** **Significance of effect: Neutral**		**Significance for EIA Legislation: Not Significant**
	Field east of M5 motorway, Lodway NSWS **Importance: County/District**	Temporary loss of 0.3 ha of habitat and permanent loss of approximately 394 m^2 (2% of habitat) for bridleway extension under M5 **Magnitude: Minor** **Significance of effect: Slight adverse**	N/A	**Magnitude: Slight adverse** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Field East of Court House NSWS Importance: **County/District**	Permanent right of access and turning circle will be required along the northern edge of the field for occasional use by light vehicles. Temporary indirect construction impacts to be managed by adherence to the CEMP **Magnitude: Minor**	N/A	**Magnitude: Minor** **Significance of Effect: Slight** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
		Significance of effect: Slight adverse		
	Woodland and trees and horseshoe bats navigational route **Importance: Regional**	See North Somerset and Mendip bats SAC above		
	Hedgerow at Lodway Compound **Importance: Local**	Loss of habitat **Magnitude: Major** **Significance of effect: Moderate adverse, likely significant effect**	Replant hedgerow with native woodland mix of species comparable to the current species diversity. Railway Landscape Plans (Disused Line) DCO Document Reference 2.10.	**Magnitude: Moderate** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Great crested newts **Importance: District**	Loss of terrestrial habitat. **Magnitude: Moderate** **Significance of effect: Moderate adverse, likely significant effect**	Retain as much vegetation as possible, replanting vegetation. Railway Landscape Plans (Disused Line) DCO Document Reference 2.10.	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
			The granted DLL means populations will be protected through developer contributions to create strategic favourable offsite compensatory habitat at locations to be decided by NE.	
	Other amphibians except toads **Importance: Local**	Loss of terrestrial habitat. Temporary indirect construction impacts to be managed by adherence to the CEMP. **Magnitude: Moderate** **Significance of effect: Slight adverse**	Mitigation for GCN and reptiles will also benefit other amphibians. Retain as much vegetation as possible and replanting vegetation. Installation of hibernacula. Railway Landscape Plans (Disused Line) DCO Document Reference 2.10 Environmental Masterplan DCO Document Reference 2.53.	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Toads **Importance: Regional**	Loss of terrestrial habitat. Disruption and severance of key toad mitigation routes. **Magnitude: Moderate** **Significance of effect: Moderate adverse**	As for other amphibians. Other mitigation at Lodway Compound such as amphibian fencing and restricting vehicle movement during peak migration after dark. Reptile and Amphibian Mitigation Strategy (Appendix 9.13, DCO Document Reference 6.25).	**Magnitude: Negligible** **Significance of Effect: Slight** **Significance for EIA Legislation: Not Significant**
	Badgers **Importance: Local**	Sett loss, loss of foraging and dispersal habitat managed by adherence to Master CEMP and draft badger licence **Magnitude: Moderate** **Significance of effect: Slight adverse**	N/A	**Magnitude: Moderate** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Bats foraging/navigational route (non SAC bats) **Importance: Regional**	Partial loss of navigational route and foraging habitat **Magnitude: Minor**	Retain as much vegetation as possible and replanting vegetation to maintain the navigational route for bats.	**Magnitude: No Change** **Significance of Effect: Neutral**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
		Significance of effect: Moderate adverse, likely significant effect	Railway Landscape Plans (Disused Line) DCO Document Reference 2.10.	**Significance for EIA Legislation: Not Significant but Uncertain.**
	Bat roosts in structures and trees **Importance: Local (at best)**	Repairs to bridges will destroy roosts. Draft bat licence. Potential loss of tree roosts to be checked by adherence to CEMP and bat licence (if necessary) **Magnitude: Minor** **Significance of Effect: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Breeding passerine birds **Importance: Local**	Damage/destruction of nests. Adhere to CEMP. **Magnitude: Minor** **Significance of Effect: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Barn owl **Importance: Local**	Loss and disturbance of roosts. Survey known potential roosts and avoid loss during detailed design (or mitigate under licence) and protect from disturbance as part of CEMP. Permanent loss of foraging areas: 0.1 ha (1% of habitat at Portbury Wharf NR) and temporary loss of 0.6 ha (18% of habitat at Portbury Wharf NR and 7.7 ha (5% of suitable foraging habitat to the east of M5) by temporary use of Lodway construction site compound. **Magnitude: Moderate** **Significance of Effect: Slight adverse**	Barn owl box at Portbury Wharf NR located c200 m from Portishead to Pill line has been moved to a part of the reserve more distant from the DCO Scheme by the National Grid Hinkley Point C Connection project.	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Reptiles **Importance: District**	Habitat loss. Fragmentation avoided by design. **Magnitude: Moderate** **Significance of effect: Moderate adverse, likely significant effect**	Retain as much vegetation as possible and replanting vegetation. Installation of reptile hibernacula.	**Magnitude: Minor** **Significance of Effect: Slight adverse**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
			Railway Landscape Plans (Disused Line) DCO Document Reference 2.10 Environmental Masterplan DCO Document Reference 2.53	**Significance for EIA Legislation: Not Significant**
	Otter **Importance: District**	Loss of 394 m^2 (2% of habitat) from M5 bridleway extension **Magnitude: Minor** **Significance of Effect: Slight adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Water voles **Importance: Local**	Potential loss of habitat. Pre-construction surveys required as part of CEMP. **Magnitude: Negligible** **Significance of Effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
Construction site noise, pollution incidents, dust, lighting and vibration. CoCP and Master CEMP to require contractor to adhere to best practice in their CEMP to minimise impacts.	Severn Estuary, SPA, Ramsar, SSSI **Value: International/national**	No temporary indirect construction impacts predicted due to distance from construction works and relatively low numbers of SPA birds present approximately 500m away from the works **Magnitude: Negligible** **Significance of effect: Slight adverse**	N/A	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Portbury Wharf Nature Reserve Priory Farm (AWT Reserve) **Value: County**	No temporary indirect construction impacts predicted **Magnitude: Negligible** **Significance of effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Field east of M5 motorway, Lodway, NSWS Drove Rhyne and adjacent fields NSWS	Temporary indirect construction impacts to be managed by adherence to the CEMP **Magnitude: Negligible** **Significance of effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Fields between railway line and A369, Portbury NSWS Land adjacent to Severn Estuary SSSI (Portbury) NSWS Fields between A369 and M5 motorway, Portbury NSWS Fields on Caswell Moor NSWS Fields adjacent to M5 motorway, Portbury NSWS Lamplighter's Marsh SNCI Lamplighter's open space BWCS **Importance: County/District**			**Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Bat roost at Derelict Store **Importance: local**	Indirect noise impacts to be managed by adherence to the CEMP **Magnitude: Minor** **Significance of Effect: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Otters **Importance: District**	Indirect impact from noise, lighting and machinery to be managed by adherence to the CEMP **Magnitude: Minor** **Significance of Effect: Slight adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
Killing or injury of animals. Disturbance of animals.	Great crested newts **Importance: District**	Potential to kill or injure animals during site clearance **Magnitude: Moderate** **Significance of Effect: Moderate adverse, likely significant effect**	Reasonable avoidance measures will be implemented.	**Magnitude: Negligible** **Significance of Effect: Neutral**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
CoCP and Master CEMP to require contractor to adhere to best practice in their CEMP to minimise impacts. Draft badger licence				**Significance for EIA Legislation: Not Significant**
	Other amphibians except toads **Importance: local**	Potential to kill or injure animals during site clearance **Magnitude: Moderate** **Significance of Effect: Slight adverse**	Measures for reptiles and GCN will avoid impacts on other amphibians.	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Toads **Importance: Regional**	Potential to kill or injure animals during site clearance **Magnitude: Moderate** **Significance of Effect: Moderate adverse**	As for other amphibians. Other mitigation at Lodway Compound such as amphibian fencing and restricting vehicle movement during peak migration after dark. Reptile and Amphibian Mitigation Strategy (Appendix 9.13, DCO Document Reference 6.25).	**Magnitude: Negligible** **Significance of Effect: Slight** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Breeding Birds **Importance: local**	Potential to destroy active bird nests during site clearance. Adherence to CEMP. **Magnitude: Minor** **Significance of Effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Badgers **Importance: local**	Potential disturbance from machinery and noise, potential entrapment in open excavations. Adherence to Master CEMP and draft badger licence. **Magnitude: Moderate** **Significance of Effect: Slight adverse**	N/A	**Magnitude: Moderate** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Reptiles **Importance: District**	Potential to kill or injure animals during site clearance. **Magnitude: Moderate** **Significance of Effect: Moderate adverse, likely significant effect**	Adherence to Reptile and Amphibian Mitigation Strategy (Appendix 9.13, DCO Document Reference 6.25) which includes trapping and relocation of reptiles and displacement and destructive search.	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Otters **Importance: District**	Potential disturbance from machinery and noise, potential entrapment in open excavations. Adherence to CEMP. **Magnitude: Minor** **Significance of Effect: Slight adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
Construction activities Portbury Freight Line				
Site clearance causing loss of habitat. Designed to minimise impacts by e.g. minimal land take from designated sites. CoCP and Master CEMP to require the contractor to include procedures including pre-construction surveys. Draft licences for badgers and bats.	Avon Gorge Woodlands SAC. Avon Gorge SSSI Leigh Woods NNR Leigh Woods/Oak Woods Ancient Woodland Rownham Woods Ancient Woodland SAC grassland habitat Tunnel portals **Importance: International/National**	Clearance of woodland and vegetation leading to habitat loss, removal and potential damage to rare and important plants. Potential spread of invasive species and pathogens. **Magnitude: Up to Major Significance of Effect: Large adverse, likely significant effect**	Mitigation for habitat loss by management of invasive non-native species elsewhere within the SAC to improve the quality of the SAC or alternatively, for woodland, within FC land outside of the SAC. Planting of rare whitebeam saplings at three of the four locations as part of two alternative 'packages' within secondary (recent) woodland as detailed in the AGVMP (DCO Document Reference 8.12). Fence off rare plants and SAC grassland on River Avon Tow Path to avoid inadvertent damage by vehicles using Tow Path to access for works to structures.	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Rare plants: rare whitebeam trees **Importance: International**	Clearance of woodland and vegetation leading to habitat loss, removal and potential damage. Potential spread of invasive species and pathogens. **Magnitude: Up to Major** **Significance of Effect: Up to very large adverse, likely significant effect**	Mitigation for habitat loss by management of invasive non-native species elsewhere within the SAC to improve the quality of the habitat for rare whitebeams. Planting of rare whitebeam saplings at three of the four locations as part of two alternative 'packages' within secondary (recent) woodland as detailed in the AGVMP (Appendix 9.11, DCO Document Reference 8.12).	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Rare plants: Narrow-leaved bittercress **Importance: National**	Loss of plants and seeds by ballast replacement. Unlikely to be impacted due to ecology of the plant. **Magnitude: Negligible** **Significance of Effect: Slight adverse**	N/A	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Rare plants: Bristol rock-cress **Importance: National**	Loss of plants from an area assumed to be 20m^2 in size for installation of rock bolts on NR Rock Face ID06 **Magnitude: Moderate** **Significance of Effect: Large adverse, likely significant effect**	Survey the area for individual plants and avoid siting rock bolts near plants during detailed design if possible. Implement Bristol rock-cress conservation strategy (Appendix 9.11, AGVMP, DCO Document Reference 8.12)	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Rare plants: Pale St John's Wort **Importance: County/District**	Loss of plants from ballast replacement **Magnitude: Moderate** **Significance of Effect: Moderate adverse, likely significant effect**	Translocate individual plants from the cess to a safe area suitable for this species, identified by a plant specialist.	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Bower Ashton Playing Fields BWCS **Importance: County/District**	Temporary habitat loss of 0.7 ha for construction site compound and permanent habitat loss of 0.36 ha (approximately 7% of BWCS) for Clanage Road permanent compound **Magnitude: Minor** **Significance of Effect: Slight Adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Avon Gorge and Leigh Woods NSWS **Importance: County/District**	See Avon Gorge Woodlands SAC above		
	Badgers **Importance: Local**	Direct loss of setts, loss of foraging and dispersal habitats. Adherence to Master CEMP and draft badger licence. **Magnitude: Minor** **Significance of Effect: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Bat roosts in tunnels **Importance: District**	Loss of crevice roosting features in Clifton Bridge Tunnel no. 2. Adherence to draft bat licence. **Magnitude: Negligible** **Significance of Effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Bat roosts in trees **Importance: Local**	Potential tree works and loss of bat roosts. Potential loss of tree roosts to be checked by adherence to CEMP and bat licence (if necessary) **Magnitude: Negligible** **Significance of Effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Breeding passerine birds **Importance: Local**	Damage/destruction of nests. Adherence to CEMP **Magnitude: Minor** **Significance of Effect: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Dormice **Importance: National (wider woodland)**	Potential nests and habitat loss during vegetation clearance of third party rock faces. Adherence to CEMP. **Magnitude: Negligible** **Significance of Effect: Slight adverse**	N/A	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Invertebrates **Importance: County**	Loss of habitat, although significant areas will remain within the woodlands and grasslands. **Magnitude: Minor** **Significance of Effect: Slight adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
Construction site noise, pollution incidents, dust, lighting and vibration. CoCP and Master CEMP to require contractor to adhere to best practice in their CEMP to minimise impacts. Draft bat licence	Avon Gorge Woodlands SAC SAC grassland **Importance: International**	Use of machinery, storage of equipment and materials, dust, accidental impacts from site personnel, use of Tow Path for vehicle access. Adherence to CEMP. **Magnitude: Minor** **Significance of Effect: Moderate adverse, likely significant effect**	Frequency of use of vehicles on the Tow Path for construction access has not been confirmed at this stage. Access will be limited and areas of rare plants and SAC grassland protected by fencing to prevent accidental damage.	**Magnitude: No Change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Severn Estuary SPA/Ramsar/SSSI **Importance: International/National**	Indirect impact of construction noise, dust and vibration on overwintering birds. Adherence to CEMP. **Magnitude: Negligible** **Significance of Effect: Slight adverse**	N/A	**Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Severn Estuary SAC Ashton Court SSSI **Importance: International/National**	No direct impacts. Indirect impact of construction noise, pollution, dust and vibration. Adherence to CEMP. **Magnitude: No change** **Significance of Effect: Neutral**	N/A	**Magnitude: No change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Bower Ashton Playing Fields BWCS **Importance: County/District**	Impact of construction noise, dust and vibration. Adherence to CEMP. **Magnitude: Negligible** **Significance of Effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	River Avon (part of) NSWS and River Avon (part of) SNCI **Importance: County/District**	Impact of construction pollution, dust and vibration. Adherence to CEMP. **Magnitude: Negligible** **Significance of Effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Rare or notable plants **Importance: National**	Inadvertently damaged due to proximity of construction machinery and personnel. Adherence to CEMP. **Magnitude: No Change** **Significance of Effect: Neutral**	N/A	**Magnitude: No Change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Bower Ashton Allotments BWCS Land between railway line and River Avon BWCS White City Allotments BWCS Alderman Moore Allotments BWCS Bower Ashton Line BWCS Railway line near Bedminster Down BWCS Bower Ashton Mineral railway (disused) SNCI	Indirect impact of construction noise, pollution, dust and vibration. Adherence to CEMP. **Magnitude: Negligible** **Significance of Effect: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Ashton Court Estate SNCI Parson Street Station BWCS Bedminster Down Allotments BWCS Lamplighter's Marsh SNCI Ashton Court Estate NSWS Ilchester Crescent Open Space BWCS Avon Gorge SNCI Land between Hotwell Road and Sion Hill BWCS Cumberland Basin Lock BWCS Kennel Lodge Road Allotments BWCS Land between Sneyd Park and the Portway BWCS			

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Signal Station Allotments and Harbour Wall BWCS Sneyd Park SNCI Colliter's Brook SNCI Land between Windsor Place and The Paragon BWCS Clifton and Durdham Downs SNCI Cumberland Basin BWCS Butterfly Junction BWCS River Trym confluence with River Avon BWCS Manor Farm Sports Ground and playing fields BWCS Malago Valley SNCI Cornwallis Gardens BWCS Enterprise Allotments BWCS			

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Ashton Park School playing fields BWCS Land north of Ashton Valley fields BWCS Lamplighter's Open Space Bristol BWCS City and port of Bristol sports ground BWCS Trym Valley SNCI **Importance: County/District**			
	Breeding Peregrines **Importance: local**	Indirect impacts and disturbance from construction noise and vibration. Adherence to CEMP. **Magnitude: Moderate** **Significance of Effects: Slight Adverse**	Timing of construction works or disturbing activities to avoid breeding season if possible. If it cannot be avoided, Ecologist to survey nest sites for breeding behaviour and if nesting behaviour observed, discuss requirement for a licence with Natural England.	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Otter **Importance: District**	Indirect impacts and disturbance from construction noise, lighting and vibration. Adherence to CEMP. **Magnitude: Negligible** **Significance of Effects: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
Killing or injury of animals. Disturbance of animals. CoCP and Master CEMP to require contractor to adhere to best practice in their CEMP to minimise impacts. Draft badger and bat licence	Badgers **Importance: Local**	Disturbance from machinery, noise, vibration. Potential injury and death from entrapment. Adherence to Master CEMP and draft badger licence. **Magnitude: Minor** **Significance of Effects: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Bat Roosts in tunnels **Importance: District**	Potential to disturb bats from construction noise, lighting and vibration. Adherence to Master CEMP and draft bat licence. **Magnitude: Negligible** **Significance of Effects: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Bat roost Pill Station Arches **Importance: Local**	Disturbance from construction lighting, noise and vibration. Adherence to Master CEMP and draft bat licence. **Magnitude: Negligible** **Significance of Effects: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Dormice **Importance: National (wider woodland)**	No disturbance expected from use of Forestry Commission access tracks during works to rock faces. **Magnitude: No change** **Significance of Effects: Neutral**	N/A	**Magnitude: No Change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Reptiles **Importance: District**	Potential to kill or injure reptiles from construction machinery and personnel. **Magnitude: Moderate** **Significance of Effects: Moderate Adverse**	Adherence to Reptile and Amphibian Mitigation Strategy (Appendix 9.13, DCO Document Reference 6.25) which includes trapping and relocation of reptiles and displacement and destructive search.	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
Operational activities Portishead to Pill				
Vegetation maintenance. Increased noise and lighting disturbance from trains and operational use of compounds. Increased disturbance from recreation and tourism	North Somerset and Mendip Bats SAC **Importance: Regional**	To maintain the operational width of the railway line, vegetation will be cut back or killed by herbicide within the area from 3 m from the running rail (approximately 6 m width). The vegetation beyond this, on the edge of the operational railway will remain and retain the vegetated corridor and bat navigational route. **Magnitude: Negligible** **Significance of Effects: Slight Adverse**	N/A	**Magnitude: Negligible** **Significance of Effect: Slight Adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Severn Estuary SAC/SPA/Ramsar **Importance: International**	No predicted increase in recreation or tourism to the designated site which may lead to a disturbance or disruption to breeding behaviour. Noise model predicts no change in operational noise at the pools/lagoons suitable for SPA/Ramsar species. **Magnitude: No Change** **Significance of Effects: Neutral**	N/A	**Magnitude: No Change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Portbury Wharf Nature Reserve **Importance: County**	Limited operational use of Sheepway permanent maintenance compound. Birds nearby will quickly habituate. Small change in operational noise from trains predicted. **Magnitude: Minor** **Significance of Effects: Slight Adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight Adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Field East of M5 motorway NSWS **Importance: County/District**	Extension of bridleway will not be lit. **Magnitude: Negligible** **Significance of Effects: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Field East of Court House NSWS **Importance:** **County/District**	Permanent right of access and turning circle will be required along the northern edge of the field for occasional use by light vehicles. **Magnitude: Minor** **Significance of effect: Slight adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight** **Significance for EIA Legislation: Not Significant**
	Breeding birds including barn owls **Importance: Local**	Habitat will quickly re-establish to provide suitable nesting sites for breeding birds. **Magnitude: Minor** **Significance of Effects: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
				Significance for EIA Legislation: Not Significant
	Great crested newts and reptiles **Importance: District**	The mosaic of rough grassland, scrub and trees and the new GCN and reptile habitat will remain during the operational phase. **Magnitude: No Change** **Significance of Effects: Neutral**	N/A	**Magnitude: No Change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Toads **Importance: Regional**	Disruption to toad migration route on operational railway between M5 and Portbury Junction in Pill **Magnitude: Moderate** **Significance of Effects: Moderate adverse**	Installation of infrastructure (design to be confirmed by NR) to provide a gap underneath the rails and some form of 'stopper' on the rail to force toads following the rail to jump into the gap, which will assist them to cross under the rails between the M5 motorway bridge and Portbury Junction in Pill.	**If monitoring shows that mitigation is effective:** **Magnitude: Negligible** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant** **If monitoring shows that mitigation is not effective:** **Magnitude: Minor**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
				Significance of Effect: Moderate adverse **Significance for EIA Legislation: Significant**
	Otters **Importance: District**	There will be no material difference that would lead to an increase in disturbance to otters due to the service not running from 12pm to 6am and limited lighting and only a minor change in noise. **Magnitude: Minor** **Significance of Effects: Slight adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
Collision with trains on operational railway causing death or injury	Badgers **Importance: Local**	A minor increased risk of collision associated casualties is predicted from the operation of the railway. **Magnitude: Minor** **Significance of Effects: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
				Significance for EIA Legislation: Not Significant
	Bats – navigational route **Importance: Regional**	The train speed will be slow due to trains accelerating/decelerating between stations except for a short distance where it will be fast enough to be a potential collision risk (75 mph). The use of the navigational route by bats is dispersed with no large roosts present. **Magnitude: Negligible** **Significance of Effects: Slight Adverse**	N/A	**Magnitude: Negligible** **Significance of Effect: Slight Adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
Operational activities Portbury Freight Line				
Increased noise and lighting disturbance from more frequent trains. Increased disturbance from recreation and tourism. Network Rail's SMS and VMP (Appendix 9.15, DCO Document Reference 6.25).	Avon Gorge Woodland SAC/SSSI Leigh Woods NNR Leigh Woods/Oak Woods Ancient Woodland Rownham Woods Ancient Woodland Woodland and Trees SAC grassland Tunnel portals Rare and notable plants **Importance: International/National**	Clearance of woody vegetation within 3 m of the running rail will be undertaken in line with Network Rail's SMS and VMP. The SMS will be reviewed in 2023. Rock face operational impacts are undertaken with consent from NE. Increase in NO_x concentrations and rates of nitrogen and acid deposition are very small, with a scheme contribution to the lower critical level /load of less than 1%. **Magnitude: Negligible** **Significance of Effects: Slight Adverse**	N/A	**Magnitude: Negligible** **Significance of Effect: Slight Adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
Draft bat licence	Severn Estuary SPA/Ramsar/SSSI **Importance: International/National**	Overwintering birds will be unaffected due to no predicted change in noise and the designated site within the vicinity of the DCO Scheme is already disturbed by freight line trains, M5 traffic and dog walkers. **Magnitude: No Change** **Significance of Effects: Neutral**	N/A	**Magnitude: No Change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Severn Estuary SAC **Importance: International**	No potential for run off or contamination during the operation of the scheme due to no hydrological linkages. **Magnitude: No Change** **Significance of Effects: Neutral**	N/A	**Magnitude: No Change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Avon Gorge and Leigh Woods NSWS **Importance: County/District**	See Avon Gorge Woodlands SAC above		

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Watercourses **Importance: County/District**	No operational changes to the management of watercourses or indirect impacts are anticipated. **Magnitude: No Change** **Significance of Effects: Neutral**	N/A	**Magnitude: No Change** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Bat roosts in tunnels **Importance: District**	More frequent operation of trains may cause lesser horseshoe bats that hang from tunnel walls of Clifton Bridge Tunnel no. 2 to be displaced. The draft bat licence includes provision of alternative bat roosts. **Magnitude: Negligible** **Significance of Effects: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
	Social activity of bats in tunnels **Importance: District**	More frequent operation of trains may affect social activity before 12pm (when service ceases). **Magnitude: Minor** **Significance of Effects: Slight adverse**	N/A	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**
	Bat roost at Pill Station Arches and horseshoe bat navigational route **Importance: Local**	Operational lighting from Pill Station predicted to cause horseshoe bats to abandon roost and deter bats using the navigational route along the freight line at Pill **Magnitude: Major** **Significance of Effects: Moderate Adverse**	To retain the roost resource in arches 1 and 2 when Pill Station is reopened, a door with dedicated bat access will be fitted to Arch 1 and Arch 2 will be partially covered, retaining bat access. Highway and Pill Station car park lighting modified (Appendix 9.18, Lux lighting plans for Pill Station car park and highways, DCO Document Reference 6.25)	**Magnitude: Minor** **Significance of Effect: Slight adverse** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
			A permanent screen will be installed on the disused platform to shield light from Pill Station platform, steps and ramp or NR will modify lighting design at detailed design stage.	
	Bats – trees **Importance: Local**	Limited number of trees with bat roost potential within 3 m of the running rail due to continued maintenance of freight line leading to young tree stock. **Magnitude: Minor** **Significance of Effects: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Birds including peregrine falcon **Importance: Local**	Loss of breeding and foraging habitat within 3m of the running rail but this will not be significantly different compared to the operational freight line to lead to any effect on breeding birds and significant areas will remain within the woodlands.	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
		Peregrines predicted to habituate to increased frequency of trains. **Magnitude: Negligible Significance of Effect: Neutral**		
	Reptiles **Importance: District**	The mosaic of rough grassland, scrub and trees will remain during the operational phase. **Magnitude: Negligible Significance of Effects: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
	Invertebrates **Importance: County**	Habitat will be managed within 3m of the running rail but this will not be significantly different compared to the operational freight line to lead to any effect on invertebrates and significant areas of habitat will remain within the woodlands. **Magnitude: Negligible**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

Table 9.32 Summary of construction and operational impacts and effects

Aspect of the Project and control measures embedded in the DCO Scheme	Receptors	Impact	Environmental Mitigation	Residual Effects
		Significance of Effect: Neutral		
	Otter **Importance: District**	The service does not operate from 12pm to 6am and there will be only minor changes in noise and light compared to the operational freight line. **Magnitude: Negligible** **Significance of Effects: Neutral**	N/A	**Magnitude: Negligible** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**
Collision with trains on operational railway causing death or injury	Badgers **Importance: Local**	A minor increased risk of collision associated casualties is predicted from the operation of the railway. No change in disturbance to badgers compared to operational freight line. **Magnitude: Minor** **Significance of Effects: Neutral**	N/A	**Magnitude: Minor** **Significance of Effect: Neutral** **Significance for EIA Legislation: Not Significant**

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9.12 Acronyms

APIS	Air Pollution Information System
AQS	Air Quality Strategy
AWI	Ancient Woodland Inventory
AWT	Avon Wildlife Trust
BAP	Biodiversity Action Plan
BBAP	Bristol Biodiversity Action Plan
BRERC	Bristol Regional Environmental Records Centre
BWCS	Bristol Wildlife Corridor Site
CRoW	Countryside and Rights of Way Act
cSAC	Candidate Special Area of Conservation
dB	Decibels
DLL	District Level Licensing
EcCoW	Ecological clerk of works
eDNA	Environmental DNA analysis for presence of great crested newts
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
EPS	European protected species
FC	Forestry Commission (including Forestry England)
GCN	Great Crested Newts
GRIP	Governance for Railway Investment Projects
HRA	Habitat Regulations Assessment
HSI	Habitat Suitability Index
IUCN	International Union for Conservation of Nature
JLTP	Joint Local Transport Plan

JNCC	Joint Nature Conservation Council
LNR	Local Nature Reserve
MAGIC	Multi-Agency Geographic Information for the Countryside
NE	Natural England
NERC	
Act 2006	Natural Environment and Rural Communities Act 2006
NGR	National Grid Reference (Ordnance Survey)
NNR	National Nature Reserve
NPPF	National planning policy framework
NSBAP	North Somerset Biodiversity Action Plan
NSDC	North Somerset District Council
NVC	National Vegetation Classification
SAC	Special Area of Conservation
SCI	Sites of community importance
SNCI	Sites of nature conservation interest
SPA	Special Protection Area
SMS	Site Management Statement
SSSI	Site of Special Scientific Interest
TPO	Tree Preservation Order
VMP	Vegetation Management Plan
WCA	Wildlife and Countryside Act 1981 (as amended)
WS	Wildlife site