Preliminary Ecological Appraisal | Pembrokeshire | PEM 258 miles 1450 yards to 274 miles 1100 yards | April 2019 | OP 156917

For Geotechnics, Off-Track and Drainage: Wales Route

September 2019

Prepared by: [redacted]
Checked by:
Approved by: [redacted]

3rd Floor St Patricks House
17 Penarth Road
Cardiff
CF10 5ZA

A2 Quality Assurance

Prepared by : Ecologist (Ecus Ltd / Network Rail)

[redacted] Date: 26/03/19

[redacted]

Checked by : Principal Ecologist (Ecus Ltd)

[redacted] Date: 17/04/2019

[redacted]

Approved by: Regional Manager (Ecus Ltd)

[redacted] Date: 30/08/2019

[redacted]

Accepted by :

..... Date:

Document History

Issue	Date	Originator	Modification
V1	26/03/2019	[redacted]	First draft
V2	17/04/2019	[redacted]	First draft QA revised
V3	02/07/2019	[redacted]	Second draft revised
V4	11/07/2019	[redacted]	Third draft revised
V4	30/08/2019	[redacted]	Third draft QA
V5	02/09/2019	[redacted]	Fourth draft revised

A3 Contents

A4 Executive Summary

This Preliminary Ecological Appraisal (PEA) has been undertaken on behalf of the Network Rail Wales Route, ahead of proposed vegetation clearance works to be undertaken at trackside habitats between mileage PEM 258.1450 to 274.1100 miles; Whitland to Tenby. The purpose of this PEA was to identify the ecological constraints to proposed works on Site and, if required, provide recommendations for further survey and mitigation.

An extended Phase 1 habitat survey was carried out to assess Site potential to support species and habitats protected under UK and European nature conservation legislation.

The exact scope of works will comprise one of the following two options:

- Selective removal of all 'high risk' Tier 1 and 2 trees, and removal of any dead, decaying or dying trees considered to pose a risk to the rail, as determined by an arboriculture assessment. Network Rail has a strategic programme to improve the management of its Asset Information (AI). The Offering Rail Better Information Services (ORBIS) database is used to highlight trees considered to present a risk to rail safety, that are required to be subject to evaluation and potential removal. This is achieved by categorising trees into tiers, with Tier 1 and Tier 2 representing the highest risk levels.
- Removal of all tree species complying with the new Network Rail Standard NR/L2/OTK/5201/02 for vegetation management, which requires clearance of vegetation within the area extending upwards from 45° from the outer running rail.

It is recommended that Option 1 outlined above is employed; this option requires significantly less vegetation removal, and as a result it is anticipated that Option 1 would have a smaller adverse impact upon ecological receptors. However, to ensure a robust evaluation of impacts, the assessment below is based upon a 'worst case scenario' with a greater level of vegetation clearance required, as presented by Option 2.

The Phase 1 habitat survey and desk study have indicated the following ecological receptors represent constraints to the proposed site works. Requirements for further survey, assessment, mitigation and enhancement methods have been suggested, where necessary.

Receptor	Specific Mitigation / Enhancement
High Risk -Further survey, consents or EPS licence required prior to works commencement	
Designated sites: SACs	The SACs which may be impacted by the proposed works are the Pembrokeshire Bat Sites and Bosherton Lakes SAC and the Limestone Coast of South West Wales SAC. A Habitat Regulations Assessment (HRA) Screening assessment will likely be required where the proposed works are within 10km of the Natura 2000 sites in order to assess whether the works will have an adverse effect on the features of the designated sites. If the screening assessment indicates a significant impact is considered likely, a full Appropriate Assessment will be required. Consultation with NRW is recommended with regard to the scope of any HRA assessment.
Ancient Woodland	NRW will be consulted where work will be undertaken within ancient woodland, and further mitigation will need to be agreed prior to works commencing, where necessary.
TPOs	Works to avoid trees with Tree Preservation Orders (TPO), where possible. TPO within clearance area should be demarcated and care taken to avoid damage during works. Should removal or management be unavoidable permission must be obtained from the Local Authority.
Bats	Further survey is required for trees with moderate and high bat roost potential (see Appendix 2). The survey would comprise either an endoscopic inspection of each identified tree, or nocturnal activity survey for trees considered to offer moderate potential (two surveys) and high potential (three surveys) to bats. The work would be undertaken by a suitably licenced ecologist during the active bat season (May to August inclusive). If bat roost presence is confirmed, a European Protected Species (EPS) licence must be obtained before works can proceed.

Hazel dormouse	A presence/ absence survey must be completed within dormouse suitable habitat prior to works commencing. Consultation with NRW would be undertaken to inform the scope of the surveys. If dormouse presence is confirmed, an EPS licence must be obtained before works can proceed.
Moderate Risk- Mitigation required for protected or notable species	
Priority habitats- Woodland, hedgerow.	It is recommended that works are limited to the removal of high safety risk trees (Tier 1 and 2 trees, and trees that are dead, decaying or dying) and those needed to facilitate works only. Smaller trees, shrubs and understorey to be retained wherever possible. Herbicide treatment limited to treating stumps only and using glyphosate. Exclusion zones (minimum of 7m) to be demarcated around invasive species to prevent their spread, and biosecurity measures implemented during works.
Amphibians	Existing log / brash piles to be retained where possible. Any existing log / brash piles to be moved must be dismantled by hand to search for amphibians prior to removal under the guidance of an Ecologist. Where 'to ground' clearance is required, a two-stage methodology should be employed under guidance from an Ecologist: vegetation should be cut to 30 cm utilising hand tools only. The area should be left for 24 hours to allow amphibians to leave the area, and then following a visual inspection for amphibians, the remainder of the vegetation can be removed to ground.
[redacted]	[redacted]
Bats	Trees with low bat roost potential (see Appendix 2) to be removed using a "sectional fell" methodology, as follows: Where possible first the ivy will be hand-stripped and additional roost features (e.g. cavities or rot hollows) searched for. If there is concern that bats may be present within features not previously identified, work to the tree must stop and the ecologist contacted immediately for advice. The Ecologist's advice may include: tree limbs and trunk to be carefully cut and lowered to the ground, where they should be left in place for at least 24 hours, with any cavities facing upwards. Remaining trees to be removed utilising best practice methodology.
Birds	Works should avoid the nesting bird season (March to September inclusive). If this is not possible, a nesting bird check will be undertaken immediately prior to vegetation removal. If nesting birds are present within the works area, an exclusion zone (minimum 5 m, depending on the species of bird) will be installed around the nest. No works will be undertaken within the exclusion zone until the chicks have fledged (to be determined by a suitably qualified ecologist).
Reptiles	Existing log / brash piles to be retained where possible. Any existing log / brash piles to be moved must be dismantled by hand to search for reptiles prior to removal under the guidance of an Ecologist. Where 'to ground' clearance is required, a two-stage methodology should be employed under guidance from an Ecologist: vegetation should be cut to 30 cm utilising hand tools only. The area should be left for 24 hours to allow amphibians to leave the area, and then following a visual inspection for reptiles, the remainder of the vegetation can be removed to ground.
Otter	A pre-works site walkover by an Ecologist should be carried out to identify whether additional holts have been established. It is recommended best practice methodologies (e.g. pollution prevention measures) in relation to working around watercourses be employed. No herbicides should be used within 5 m of a waterbody without prior permission from NRW with only glyphosate being used in areas identified as having Biodiversity interest. Steps should be taken to ensure that material arisings from vegetation clearance (i.e. chippings / brash) and chemicals are not discharged into waterbodies.
Hedgehog	Any existing log / brash / leaf litter piles that need to be disturbed or moved must be dismantled by hand prior to removal. Works in these areas should be undertaken with hand tools only (chainsaws and brush cutters).

Polecat	Suitable habitat (woodland, grassland, scrub etc) should be retained where possible. Works in these areas should be undertaken with hand tools only (chainsaws and brush cutters), to allow polecats to vacate daytimes resting sites if present.
Invasive Non-Native Species (INNS)	Invasive species management and treatment should be undertaken using glyphosate. Where this is not possible an exclusion zone (minimum 7 m) will be set up by a suitably qualified ecologist around stands of INNS (e.g. Japanese knotweed and Himalayan balsam) prior to works commencing. No works will be undertaken within the exclusion zone. Best practice biosecurity measures for working in proximity to INNS should be followed.
Compensation	
Habitats	Supplementary planting of native shrub, small trees species and hedgerow species in appropriate locations.
Bats	Installation of bat boxes on suitable trees outside of the works area. Bat boxes should be installed under the guidance of an Ecologist on the southern elevation of suitable trees, at a minimum of 4 m in height from the ground, located away from significant light spill.
Birds	Installation of a variety of bird nest boxes within the woodland outside of the works area under the guidance of an Ecologist. Nest boxes should be placed at a minimum of 3 m from the ground, at a variety of aspects. South facing aspects have potential to overheat however if in direct sunlight, so should be avoided.
Enhancement opportunities	
Habitats	Selective removal and treatment of non-native species (cherry laurel and Himalayan honeysuckle) outside works area. Supplementary planting of native shrub and scrub species in appropriate locations. Enhance retained hedgerows through infill planting of gaps with native hedgerow species or hedgerow laying. Sow species-rich wildflower seed mixes on retained grassland habitats. Enhance other native species habitats to compliment the local biodiversity.
Amphibian Reptiles Hedgehog	Creation of dedicated log / brash piles on Site from material arising from works, to provide additional sheltering and hibernating habitat. These hibernacula will follow guidance / design by an Ecologist.
Bats and Birds	Installation of additional bird and bat boxes in a variety of designs under the guidance of an Ecologist, above the minimum number recommended for each area of suitable habitat cleared.

A5 Introduction

This Preliminary Ecological Appraisal (PEA) has been undertaken on behalf of the Wales Route within Network Rail, ahead of proposed vegetation clearance works to be undertaken at trackside habitats between mileages PEM 258 miles 1450 yards to 274 miles 1100 yards (hereafter referred to as the "Site").

The purpose of this PEA was to identify the ecological constraints to proposed works on Site. This was achieved by undertaking an extended Phase 1 habitat survey of the Site, and from this evaluating potential for the Site to support or be used by species and habitats protected under UK and European nature conservation legislation.

This PEA draws information from the desk study and Site visit, to assess the impacts of the proposed works upon Site habitats and species. This report details the methodology and findings of the survey work and impact assessment. Recommendations for additional survey works and mitigation measures are included, where appropriate.

Site Description

The Site is located on the Pembroke and Tenby Branch (PEM) line, comprising approximately 28 miles of railway line between Whitland in the north and Tenby in the south. Figure 1 below illustrates the Site location.

The Site located between Whiteland and Pembroke Dock extends through a variety of habitats; including woodland, grassland, agricultural/ pastural land and urban areas.

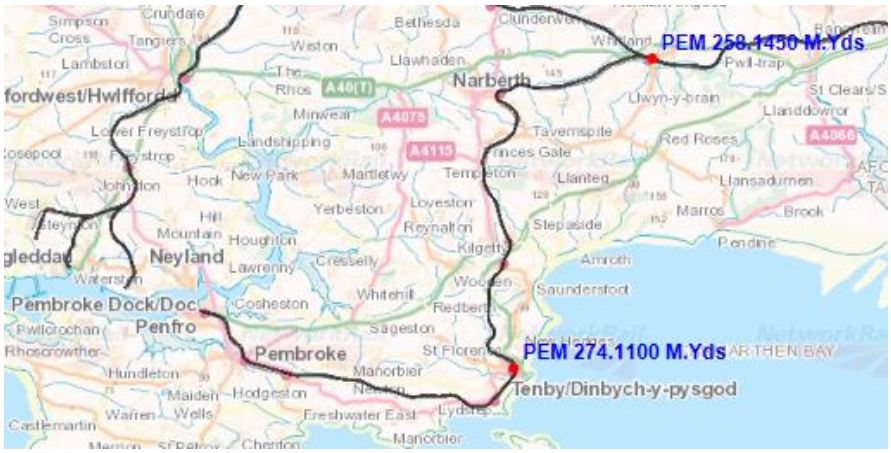

Figure 1: Site Locations (From Geo-RINM)

Proposed Works

The Wales Route have proposed a programme of vegetation management works to be undertaken across the country to comply with the Network Rail standards for vegetation management and ensure the safe operation of the railway assets. These works will require de-vegetation works to be undertaken on the trackside habitats across the Site. A full scope of works is provided in Section A9.

A6 Legislation

The main pieces of UK legislation that provides protection for species and habitats within the UK are as follows:

- The Wildlife & Countryside Act 1981 (as amended) ("WCA 1981");

- The Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations");
- The Environment (Wales) Act 2016 ("EWA 2016"); and
- The Protection of Badgers Act 2002.

A summary of the legislation in relation to specific species is provided in Appendix 1. Further information regarding protection of species and habitats under UK Legislation is available at https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity .

A7 Methodology

A7.1 Desk Study

Several data sources have been consulted to determine the potential ecological baseline conditions within and in proximity to the Site.

Although the West Wales Biological Information Centre (WWBIC) covers the geographical area in which the Site is located, all four record centres within Wales have a central biological record database within which all recorded data is held. The Aderyn system is the online database search tool which can be used to carry out a data search on the combined records data.

The Aderyn system was consulted in January 2019, to obtain ecological records held for protected and notable species of flora and fauna, as well as records for non-statutory designated sites within 2 km of the Site.

The Government Multi-Agency Geographic Information for the Countryside (MAGIC) website (http://magic.gov.uk) and the Lle Wales Geo-portal (http://lle.gov.wales) were also consulted to obtain the following information.

- Ramsar sites, National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA) located within 5 km of the Site;
- Sites of Specific Scientific Interest (SSSI) designated for biological interest and Local Nature Reserves (LNR) within 1 km of the Site; and
- Ancient Woodland sites located adjacent to the Network Rail boundary.

Information returned from the desk study is summarised within relevant sections of the report.

Desk Study Results Matrix

In order to determine potential ecological risks and opportunities at the smallest meaningful unit utilised by Network Rail (pre-defined 1/8th mile sections listed within the Network Rail asset database) a desk study results matrix has been produced using a buffer analysis of the record data.

The buffer analysis has taken ecological records and attributed one of three buffer zones (Category A-C).

For species records, Category A represents the buffer zone closest to the Site, within which there is the greatest likelihood that a species is present on Site (where suitable habitat exists), whilst Category C is indicative of there being no records of a species present within 2 km of the Site, which represents the lowest likelihood of species being present based on

record data.

For designated site records, Category A represents the closest buffer zone within which protected sites are considered to represent a potential receptor to proposed works on Site given the distance between the designated site and the Site, and further investigation is therefore required. For Special Areas of Conservation (SAC) and Special Protection Areas (SPA), Category B represents the buffer zone within which mobile species within the designated sites (such as bats and birds) may present a potential receptor. Beyond this (Category C), the distance is sufficient that the designated sites are considered highly unlikely to represent a receptor to works.

The buffer zones for each species have been determined based upon standing advice / technical guidance from the Statutory Nature Conservation Organisation, species specific ecological and survey guidance and professional judgement. The Ecological Desk Study Buffer (ref: DESK_STUDY_ECOLOGICAL_BUFFERS_V2) document outlines the distances used within the buffer analysis and justification for their selection, with supporting references.

The buffer Categories should not be used in isolation to evaluate the impacts to ecological receptors. However, this data can be used alongside Extended Phase 1 habitat data derived from a site visit to assess the habitat present within the Site and provide an assessment of the ecological impact of proposed works.

A7.2 Field Survey

Extended Phase 1 Habitat Survey

A site visit comprising an extended Phase 1 Habitat survey was undertaken by Consultant Ecologist Catherine Pittman in March 2019, in accordance with the industry standard guidelines (JNCC, 2010), during daylight hours. The survey details are summarised in Table 1 below:

Table 1. Summary of Site survey details.

Date	Time	Weather
04/03/19	07:00-15:00	6°C, overcast, cloud cover=50%, wind (Beaufort)=1, no precipitation.
05/03/19	08:00-17:00	7°C, overcast, cloud cover=100%, wind (Beaufort)=2, very light to light throughout day.
06/03/19	08:00-17:00	7°C, overcast, cloud cover=100%, wind (Beaufort)=2, light precipitation, heavy in the afternoon
07/03/19	08:00-13:00	6°C, overcast, cloud cover=50%, wind (Beaufort)=3, no precipitation.
18/03/19	07:30-15:30	6°C, overcast, cloud cover=100%, wind (Beaufort)=0, light precipitation.
19/03/19	07:30-15:00	9°C, cloud cover=50%, wind (Beaufort)=1, no precipitation. Moderate precipitation in the afternoon.
20/03/19	07:30-14:30	9°C, overcast, cloud cover=100%, wind (Beaufort)=1, light precipitation.

The habitats and vegetation types present were recorded on a field map. Notable, rare or scarce plant species were highlighted, where present. The extended Phase 1 survey method aims to characterise habitats and communities present within the Site and is not intended to provide a complete list of all plants occurring across the Site.

Guidelines for PEA produced by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017) have been employed to determine the value and sensitivity of ecological receptors (species, habitats and protected sites) present within or in proximity to

the Site.

Protected and notable species

Evidence of, or potential for, protected and notable species observed during the Site visit was recorded. These include field signs, such as footprints, latrines, burrows, or feeding remains, as well as habitats considered suitable for supporting protected species.

The trees were subject to an external visual assessment, undertaken from ground level using binoculars. Trees were assessed for their potential to support roosting bats in accordance with best practice guidelines (Collins, 2016). Trees were categorised as providing negligible, low, moderate or high potential to support roosting bat, based on the number and type of roosting features identified as well as the surrounding landscape character. The trees and habitats were also assessed for potential to support commuting and foraging bats.

Limitations

The Site visit was undertaken in March, which is outside of the optimal season for botanical surveys. Nonetheless, it is considered that habitats present on Site were accurately categorised, based upon the plants that were identifiable at the time of survey.

Due to access constraints and site topography, it was not possible to access the entire area within the Network Rail owned boundary, for example in areas of steep cuttings would prevent safe ascent of the banks. As such much of the Site visit was undertaken from trackside. For the majority of the Site this is not considered a significant limitation because the thin linear nature of the railway corridor allowed a satisfactory view of the Site from the trackside. Furthermore, it was not possible to access 360° around trees, especially in 3rd party land. As such the trees were assessed from all possible angles from the trackside and cess cuttings / embankments. To compensate for this, a precautionary approach has been taken to evaluate trees for bat roost potential. In addition, three of the trees could not be assessed, due to evergreen foliage obscuring a clear view of the tree.

Record centre data for protected species has been included to provide an indication of the flora and fauna species that may utilise the habitats present on Site. However, records are obtained from a number of sources and may not provide a comprehensive understanding of the ecological status of an area. As such, species record data should not be used in isolation to determine likely presence of a species within or adjacent to Site and impacts of Site works.

The survey was intended to provide a rapid assessment of habitats and potential for protected species that may be present on Site. It provides a snapshot of the current ecological status and is not intended to replace detailed vegetation or species-specific surveys. Requirements for further survey, where necessary, are outlined in the appropriate sections.

A8 Baseline Ecological Conditions

A8.1 Designated sites

There are four Special Areas of Conservation (SAC) and one Special Protection Area (SPA) within 5 km of the Site. There are four Sites of Special Scientific Interest (SSSI) designated for their ecological and biological value within 1 km of the Site. Details of these sites are provided in Table 2.

Aderyn returned no records of non-statutory designated sites within 1 km of the Site. There are no Sites of Importance for Nature Conservation (SINC) designated within the county of Pembrokeshire.

It is considered that the proposed works has the potential to impact upon the integrity of two of the SAC; the Pembrokeshire Bat Sites and Bosherton Lakes SAC and the Limestone Coast of South West Wales SAC.

The Pembrokeshire Bat Sites and Bosherton Lakes SAC is located 1.6 km to the south east of the Site at the closest point. The primary qualifying feature at potential risk from the proposed works are greater horseshoe bats as a mobile species. The SAC supports 9.5% of the UK population across the various sites, which make up the composite SAC, within a mix of maternity, transitory and hibernation roosts. Qualifying features also present are lesser horseshoe bats (*Rhinolophus hipposideros*), which are at potential risk from the proposed works and otter (*Lutra lutra*).

The Limestone Coast of South West Wales SAC is located 2.2 km to the south west of the Site, at its closest point. The qualifying feature of interest that has potential to be impacted by works are greater horseshoe bats (*Rhinolophus ferrumequinum*), which hibernate within the SAC and are a mobile species.

Given the limited nature of works within the Network Rail boundary and the distance from the works Site to the designated sites, it is considered unlikely that the remaining designated sites, as outlined in Table 2 will be affected by the proposed works. No mechanisms by which the works on Site may result in direct or indirect impacts to the integrity of these remaining sites have been identified and as such no impacts are envisaged. These are not discussed further within this report.

Table 2. Statutory and Non-Statutory Designated Sites

Site name	Distance / direction	Reason for designation	Potential Impact?	Assessment
Pembrokeshire Bat Sites and Bosherton Lakes SAC	1.6 km south east	Annex I habitats that are the primary reason for selection: hard oligo-mesotrophic waters. Annex II species that are primary reason for selection: greater horseshoe bat. Annex II species that are present as a qualifying feature: lesser horseshoe bat and otter.	Yes	Impact dependent on nature of works and whether impacts from Site activities will encroach into the designated sites. There is also potential for mobiles species to be impacted by the proposed works. A Habitats Regulations Assessment may be needed and NRW should be consulted. See Table 6 for full assessment.
Limestone Coast of South West Wales SAC	2.2 km south west	Annex I habitats that are the primary reason for selection: vegetated sea cliffs of the Atlantic or Baltic coasts; and fixed coastal dunes with herbaceous vegetation ("grey dune"), which is a priority feature. Annex II species that are primary reason for selection: greater horseshoe bat, early gentian (*Gentianella anglica*). Petalwort (*Petalophylltm ralfsii*) is also present as a qualifying feature.		
Carmarthen Bay and Estuaries SAC	360 m east at closest point	Annex I habitats that are the primary reason for selection: sandbanks; estuaries; mudflats and sandflats; large shallow inlets and bays; Salicornia and other annuals colonizing mud and sand; and Atlantic salt meadows. Annex II species that are primary reason for selection: Twaite shad (*Alosa fallax*). Annex II species present as qualifying feature; sea lamprey (*Petromyzon marinum*), river lamprey (*Lampetra fluviatilis*), allis shad (*Alosa alosa*), and otter.		
Afonydd Cleddau SAC	1.3 km north west	Annex II species that are the primary reason for selection: brook lamprey (*Lampetra planeri*), river lamprey, bullhead (*Cottus gobio*) and otter. Sea lamprey, a qualifying Annex II species is also present. Annex II habitats that are a qualifying feature include; Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation; active raised bogs and alluvial forests.	No	Given the nature of works and the distance between the works Site and designated Site, it is considered unlikely that the species and habitats for which the sites are designated would be impacted by works on track. As such, no mechanisms by which the works on Site may result in direct or indirect impacts to the integrity of these designated sites have been identified and as such no impacts are envisaged.
Carmarthen Bay SPA	2.1 km east	Over winter the area regularly supports common scoter (*Melanitta nigra*) at 1 % of the population over a 5 year peak mean from 1997/98 - 2001/02		
Tenby Cliffs and St. Catherine's Island SSSI	350 m east	Of special interest for its littoral rock and sandy shore communities, including two nationally scare seaweed and piddock communities. The nationally scare golden samphire (*Inula crithmoides*) and wild cabbage (*Brassica oleracea*) and nationally rare tree-mallow (*Lavatera cretica*) are present.		
Lydstep Head to Tenby Burrows SSSI	490 m south	Of special interest for its sea-cliff vegetation and rare and scarce plants, including five nationally rare species. The site also supports large population of autumn lady's-tresses (*Spiranthes spiralis*) and green-winged orchid (*Orchis morio*) with smaller stands of autumn gentian (*Gentianella amarella*) on the dunes. Notable invertebrate species include the Mediterranean snail (*Theba pisana*) and the small blue butterfly (*Cupido minimus*). Chough are present, as well as fulmar (*Fulmarus glacialis*), puffin (*Fratercula arctica*) and guillemot (*Uria aalge*) on the cliffs.		
Rhosydd Yerbeston SSSI	540 m to the east	Consists of 11 separate moors. The sites are of interest for the marshy and neutral grassland, and for populations of rare marsh fritillary butterfly (*Eurodryas aurinia*). Several uncommon plant species are present including Petty whin (*Genista anglica*) and wavy St. John's-wort (*Hypericum undulatum*). Other scarce insects include the tortoise beetle *Cassida sanguinosa* and the willow-feeding weevil *Acalyptus carpini*, which has not been found anywhere else in Wales.		
Ritec Fen SSSI	800 m south west	Of interest for an extensive area of valley and floodplain fen. A small stand of nationally scare marsh fen (*Thelypteris palustris*) is present, as well as the local scarce brown sedge (*Carex disticha*). Notable fly species have been recorded comprise *Anatella dampfi*, *Leia longiseta*, and *Mycomya britteni*.		

A8.2 Habitats

The habitats observed within the Site are considered below in order of dominance. The Ecological Constraints and Opportunities Plans (see Appendix 5), illustrates the location and extent of habitats on Site.

Dense and scattered scrub

Dense scrub is the dominant habitat type observed across the Site including in areas where past habitat management and felling works have removed the previous habitat cover and dense scrub has subsequently established. Standard trees were also present within the dense scrub habitat. In addition, there are lines of trees present on the Network Rail boundary line; it is considered that these linear features represent former hedgerows that have not been managed and have 'grown out' to create tree lines of both semi-mature and mature tree and shrub species, present at the boundary / fence line.

Species recorded include hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), dense bramble scrub (*Rubus fruticosus agg.*), hazel (*Coryllus avellana*), willow (*Salix sp.*), ash (*Fraxinus excelsior*), dog rose (*Rosa canina*), buddleia (*Buddleja davidii*), cherry laurel (*Prunus laurocerasus*), gorse (*Ulex europaeus*), silver birch (*Betula pendula*) and sycamore (*Acer pseudoplatanus*).

The diversity and age structure of the scrub habitat varies across the Site, with some areas displaying high species diversity and a structure considered to offer suitable foraging, shelter and commuting habitat for several species. The habitat forms part of 'green corridor' of habitats across the Site and provides important connectivity across the wider landscape.

Scattered scrub habitat was also recorded, which was characterised by sparser areas of scrub species, often with other grassland species, ruderal vegetation or patchy bracken dispersed within, as well as areas of bare earth or ballast.

Dense scrub and scattered scrub habitats are commonly occurring and are not listed under Section 7 of the Environment (Wales) Act 2016 (hereafter referred to as the "EWA 2016"). They are considered to be of importance to nature consideration at the Site level only.

Woodland (including Ancient Woodland)

Woodland habitat is present in several locations across the Site, most notable in areas where 3rd party woodland in present. Woodland habitats varied in characteristics and included a range of age structure from immature to mature trees, and in some areas over-mature specimens.

Species recorded include oak (*Quercus robur*), ash, several willow species including both broad-leaved and narrow-leaved species, sycamore, hazel, hawthorn, elder (*Sambucus nigra*), beech (*Fagus sylvatica*) and silver birch.

Understorey vegetation varied dependent of site-specific characteristics, with some areas of dense canopy, resulting in an open understorey layer with little vegetation. In other areas, dense scrub habitat was present in the understorey, or areas with scattered scrub and tall ruderal vegetation. Species observed include rhododendron (*Rhododendron ponticum*), holly (*Ilex aquifolium*), hazel, blackthorn, hawthorn, bracken (*Pteridium aquilinum*), bramble,

(*Galium aparine*), stinging nettle (*Urtica dioica*), hart's-tongue fern (*Asplenium scolopendrium*), lady fern (*Athyrium filix-femina*), ivy (*Hedera helix*), and opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*).

Ancient Woodland is present on 3rd party land across the Site, as identified within the Ancient Woodland Inventory 2011 layer of the Lle Geo-portal. In several locations the designated restored Ancient Woodland extends within the Network Rail boundary. Restored Ancient Woodland is defined by NRW "*as woodlands which are predominately broadleaved now and are believed to have been continually wooded for over 400 years.*" (NRW). NRW notes that the inventory designation does not mean that the woodland is fully restored or in good ecological condition.

Lowland mixed deciduous woodland is listed as a habitat of principal importance under Section 7 of the EWA 2016 and has been adopted within the Pembrokeshire and Carmarthenshire Local Biodiversity Action Plan (LBAP).

The woodland present across the Site forms part of the green network of habitat corridors present along the railway corridor and contributes to the wider woodland resource present within the landscape. As such the woodland is considered to be of local importance to nature conservation.

Hedgerows

Hedgerows are present across the Site where they form the boundary vegetation at the Network Rail boundary between the cess and the adjacent 3rd party land. The quality and condition of hedgerows on Site was limited, comprising mainly single species hedgerows or a limited diversity with scattered standard trees present. Many of the hedgerows were in poor condition, with large gaps present and limited signs of management, except for flailing activity.

Species recorded include hawthorn which was abundant, blackthorn, dog rose, hazel, oak, sycamore and willow.

Hedgerows are listed as a habitat of principal importance under Section 7 of the EWA 2016. Furthermore, hedgerows present across the Site forms part of the green network of habitat corridors present along the railway corridor. Hedgerows are common through the pastoral landscape surrounding the railway, and the quality of hedgerows present on Site is low given their limited management and lack of diversity observed. As such the hedgerows are considered to be of importance to nature conservation at the Site level only.

Semi-improved grassland

Semi-improved grassland habitat was limited to small areas between the cess and the Network Rail boundary line. Species recorded include various grass species, many of which were not able to be identified due to the time of year; those that we identified included cocks-foot (*Dactyis glomerata*), annual meadow grass (*Poa annua*), Yorkshire fog (*Holcus lanatus*), white clover (*Trifolium repens*), creeping buttercup (*Ranunculus repens*), ribwort plantain (*Plantago lanceolata*), broad-leaved willowherb (*Epilobium montanum*) and common hogweed (*Heracleum sphondylium*).

Semi-improved grassland is not listed as a habitat of principal importance under Section 7 of the EWA 2016, and composition of species is not considered indicative of more valuable priority grassland habitats. As such the grassland habitats are considered to be of importance to nature conservation at the Site level only.

Dense bracken
Dense continuous stands of bracken were present in a limited number of locations across the survey area. Scattered patches of bracken were also noted within other habitats, as previously discussed. The dense bracken did not display indicators of high value bracken habitat such as frequent violets beneath the canopy.

Dense bracken is not listed as a habitat of principal importance under Section 7 of the EWA 2016, and as such is considered of importance to nature conservation at the Site level only.

Introduced shrub
Introduced shrub habitat was recorded in residential and built-up areas where the Network Rail boundary line comprised Leyland Cypress (*Cupressus x leylandii*) hedges on the boundary line, or areas of planted species or those escaping from adjacent gardens. Species observed include Himalayan honeysuckle (*Leycesteria formosa*), Wilson's honeysuckle (*Lonicera nitida*) and a New Zealand broadleaf (*Griselinia littoralis*) hedge, forming the boundary with the adjacent garden.

Introduced shrub is not listed as a habitat of principal importance under Section 7 of the EWA 2016, and as such is considered of importance to nature conservation at the Site level only.

Ballast / cess
Generally the ballast is in good condition and free of vegetation, except where encroaching from the adjacent trackside scrub habitat. Ballast is considered to be of negligible importance to nature consideration and will not be considered further.

A8.3 Species and species groups

Results from the ecological desk study in respect to biological species records will be summarised below, along with an evaluation of the potential for species to represent an ecological receptor based on the habitats recorded during the Site visit.

Amphibians
The Aderyn software returned 17 recent records (within the past 10 years) of amphibians within 2 km of the Site. Records relate to common species only; palmate newt (*Lissotriton helveticus*), common toad (*Bufo bufo*) and common frog (*Rana temporiana*). No records were returned of great crested newt (*Triturus cristatus*) within 2 km of the Site. UK distribution maps of great crested newt indicate that this species is not present in the south west region of Wales. Therefore, this species is not considered further in this report.

Two records were located within 50 m of the Site, both relate to common toad originating from Whitehall Road in Pembroke.

Habitats on Site are considered to offer suitable habitat for amphibians including the semi-improved grassland and scattered scrub habitats, which offer foraging potential. The woodland and dense scrub habitats also limited potential for foraging, as well as sheltering and hibernation; especially in locations with brash piles / log piles present, or in areas with dense leaf litter.

Several damp / wet ditches are present across the Site, as well as waterlogged areas of trackside habitat, which offer some limited breeding habitat for amphibian species. There are no ponds suitable for supporting amphibian breeding on Site, however ponds are present in the wider landscape within 500 m, which may support any common amphibians present in

the trackside habitats. Habitat Suitability Index was not undertaken on ponds due to the absence of great crested newt within South West Wales.

During the survey, four common toad where seen on track near to the pond north of the line at PEM 262.1575 miles; of which, two of the toads were displaying breeding behaviour. It is considered the toads recorded were potentially travelling to a breeding pond to the north of the line. The trackside habitats in the area were considered to offer some limited foraging and sheltering habitat.

The quality of habitats varies across the Site; high quality optimal habitats of a suitable size for amphibians were relatively limited, although many areas with sub-optimal habitats have potential for amphibians to use on occasion. Given the availability of suitable amphibian habitat in the wider area, including extensive areas of pastoral grassland, marshy grassland and woodland, it is considered that Site habitats are of value to amphibians at the Site level only. Presence of common amphibians on Site cannot be ruled out and therefore amphibians are considered to be a potential receptor to the proposed works.

Bats

Aderyn returned 251 recent records of bats within 2 km of the Site. Species recorded comprise brown long-eared bat (*Plecotus auratus*), common pipistrelle (*Pipistrellus pipistrellus*), Daubentons's bat (*Myotis daubentonii*), greater horseshoe bat, lesser horseshoe bat, Natterer's Bat (*Myotis nattereri*), noctule bat (*Nyctalus noctule*), serotine (*Eptesicus serotinus*), soprano pipistrelle (*Pipistrellus pygmaeus*), whiskered bat (*Myotis mystacinus*), whiskered/Brandt's bat agg. (*Myotis mystacinus/brandtii* agg) and unidentified pipistrelle, long-eared and Myotis bat species.

The closest roost record relates to an unidentified pipistrelle and myotis bats, and a male lesser horseshoe bat roosting in a house called 'Lynguard' in Tenby, in 2011. The roost is located 20 m from the Site.

Trees within the Site were assessed for potential to support roosting bats. The majority of the trees on Site are young / semi-mature specimens in good condition with no obvious potential bat roost features present.

In accordance with best practice guidelines for survey (BCT, 2016) total of 158 trees were assessed as having greater than negligible potential to support bat; of which 70 have "Low" potential to support roosting bats, 72 have "Moderate" potential, and 16 have "High" potential to support roosting bats. Three trees could not be assessed, due to evergreen foliage obscuring a clear view of the tree. Details of trees with bat roost potential are provided in

Appendix 2.

The woodland and scrub habitats form part of the linear green corridor along the railway, which provide suitable foraging and commuting habitat for bat species.

The suitable habitats on Site are limited in comparison to similar habitats present within the wider landscape. Nevertheless, the railway corridor offers relatively continuous habitat of varying quality that can be used by bats for foraging and commuting. As such, Site habitats are considered to be of value to bats at a local level. Given the presence of potential bat roosts, and the value of the trackside habitats for commuting and foraging bats, bats are considered to be a potential receptor to the proposed works.

Birds

Aderyn returned 150 recent records comprising 85 species of birds within 2 km of the Site. Twenty-eight of these species are listed under Schedule 1 of the Wildlife and Countryside Act 1981. From this list the species considered reasonable likely to utilise the habitats on Site are listed below.

Table 4. Records of bird species that may utilise Site habitats.

Common name	Scientific name	BoCC Status and Protected status
Barn owl	*Tyto alba*	Schedule 1, Green
Bullfinch	*Pyrrhula pyrrhula*	Amber
Dunnock	*Prunella modularis*	Amber
Northern goshawk	*Accipiter gentilis*	Green
House sparrow	*Passer domesticus*	Red
Kingfisher	*Alcedo atthis*	Schedule 1, Amber
Linnet	*Carduelis cannabina*	Red
Mistle thrush	*Turdus viscivorus*	Red
Red Kite	*Milvus milvus*	Green
Song thrush	*Turdus philomelos*	Red
Starling	*Sturnus vulgaris*	Red
Willow Tit	*Poecile montanus*	Red
Willow warbler	*Phylloscopus trochilus*	Amber

Bird species noted utilising Site habitats or adjacent habitat during the survey comprise snipe (*Gallinago gallinago*), robin (*Erithacus rubecula*), blackbird (*Turdus merula*), and wood pigeon (*Columba palumbus*). Red kite and common buzzard (*Buteo buteo*) were seen hunting over the Site. The Site may support a number of common breeding bird species. No Schedule 1 birds or field signs of Schedule 1 birds were observed during the survey.

Given the availability of similar suitable habitats for both Schedule 1 and common nesting birds within the wider area, it is considered that the Site habitats are of value to nesting birds at the Site level only. Should vegetation clearance works be undertaken within the bird nesting season (1 March to 31 August inclusive), there is potential for disturbance to nesting birds. As such nesting birds are considered to be a potential receptor to the proposed works.

Dormouse

Aderyn returned three recent records of hazel dormouse (*Muscardinus avallanarius*) within 2 km of the Site. The closest record is located 60 m from the Site and relates to a dormouse nest found in a nest tube (2014). The habitat in which the record was made enjoys robust

connectivity with the railway line, via a corridor of trees and scrub. The other two records relate to a nest found in a nest tube and hazel nuts (2012). It is considered that the two records are duplicated and refer to a single field record. The record is located 1.05 km from the railway in an area of land adjacent to New Road in Begally. There is no direct connectivity to the railway corridor from this record location, due to presence of several A-roads and residential areas present between the two areas.

Dormice prefer relatively dense hedgerows or woodland understorey with a range of associated native flowering and fruiting species. The quality of habitats for dormice varies across the Site. It is considered that the areas of woodland, hedgerow and scrub habitat with a diversity of plant species offering varied food sources and shelter opportunities would provide optimal habitat for supporting dormice. The majority of the Site habitats are considered sub-optimal to dormice, comprising areas of woodland, scrub and hedgerows that lack the diversity of structure and plant species required to provide sufficient resources to support dormice, but may offer connectivity between areas of more suitable habitat.

The habitats on Site are common and in regards to the woodland and hedgerows there are substantial areas of these habitats within the wider landscape, which may offer suitable dormice habitat, as such it is considered that the habitats on Site are of value to dormice at a Site level only. Dormouse distribution data (JNCC, 2008, PTES, 2016) indicates that dormice distribution is restricted within Pembrokeshire, with dormice considered rare across the county. Despite this, given the presence of records within the past 10 years and the suitability of a subset of the habitats present across the Site, it is considered that the presence of dormice within the Site cannot be ruled out. As such, dormice are considered to be a receptor to the proposed works.

Reptiles

Aderyn returned 13 recent records of reptiles within 2 km of the Site. Records relate to slow worm (*Anguis fragilis*), common lizard (*Zootoca vivipara*), grass snake (*Natrix natrix*) and adder (*Vipera berus*), with the closest record pertaining to two slow worm located 50 m from Site, in a residential area of Pembroke.

The woodland, hedgerow and scrub habitat on Site, as well as piles of cut material / brash left in situ, offer suitable sheltering and hibernation habitat for common reptile species, as well as some limited foraging opportunities. The small patches of grassland and damp ditches in the cess also offer suitable foraging habitat for reptiles. Furthermore, common reptiles can be found basking on railway embankments, especially where a mosaic of habitats with bare ground are present. However, given the availability of similar and optimal habitat in the wider area, it is considered that habitats on Site are of value to reptile species at the Site level only. Reptiles are considered to be a potential receptor to the proposed works.

Invertebrates

Aderyn returned 117 recent records comprising 26 species of invertebrates within 2 km of the Site, of which one species is listed on Schedule 5 of the Wildlife and Countryside Act; the white-letter hairstreak (*Satyrium w-album*) and 22 listed on Section 7 of the Environment Wales Act 2016. The species recorded are provided in Appendix 3.

The habitats on Site are not considered suitable for White-letter hairstreak which feed exclusively on elm; elm was not noted during the survey.

The Site habitats are considered suitable for a range of common invertebrate species. Due to the availability of similar habitat in the wider landscape it is considered that the habitats on

Site are considered of value to invertebrates at the Site level only. Notable invertebrates are not considered a receptor to proposed works and will not be considered further in this report.

Riparian mammals and white-clawed crayfish

Aderyn returned 10 recent records of otter (*Lutra lutra*), the closest record located 150 m east of the Site and pertains to a dead otter found on the A478 between Pentlepoir and Twy Cross (2012). Suitable watercourses for supporting otter within 30 m of the Site were limited, and were they were present, no evidence or signs of otter were observed. The majority of habitats present on Site offer negligible potential for supporting otter, and where the Site is located in proximity to a waterbody, the habitats were considered to offer some limited potential. The presence of otter cannot be ruled out where suitable watercourses are present. As such, otters are considered a potential receptor to the proposed works.

Aderyn returned no records of water vole (*Arvicola amphibius*) and white-clawed crayfish (*Austropotamobius pallipes*) within 2 km of the Site. Given the lack of records for water vole and crayfish, combined with a lack of suitable habitats on Site for supporting these species and a lack of evidence for these species on 3rd party land, it is considered that water vole and white-clawed crayfish are not potential receptors to the proposed works and will not be considered further in this assessment.

Other protected and key species

Aderyn returned 34 recent records of hedgehog (*Erinaceus europaeus*), eight records of polecat (*Mustela putorius*) and one record of hare (*Lepus europaeus*) within 2 km of the Site.

The woodland, scrub and limited grassland habitats are considered to offer some suitable foraging and sheltering habitat for hedgehog, with the quality of habitats varying over the entire Site. Given the availability of similar habitats in the wider area, including extensive areas of grassland and garden habitats in the residential areas, it is considered that the habitats on Site are of importance to hedgehogs at the Site level only.

The presence of hedgehog on Site cannot be ruled out and as such it is considered that hedgehogs are a potential receptor to the proposed works.

Hare prefer a mosaic of open farmland and woodland edge habitats, and the habitats on Site are considered of negligible suitability for hare. It is considered that hare would be more likely to utilise the pastoral grassland outside of the Network Rail boundary rather than the Site habitats. As such hare are not considered a receptor to the proposed works and will not be considered further in this report.

Polecat favour lowland woodland habitats, hedgerows, marshes, riverbanks and farm buildings. Given the availability of more suitable habitat within the wider area it is considered that the Site habitats are of value to polecat at the Site level only. As Site habitats offer some limited suitable habitat for supporting Polecat, and their presence cannot be ruled out where suitable habitats exist, in particular where optimal habitat is present outside of the Network Rail boundary, polecat is considered to be a potential receptor to the proposed works.

Priority plant species

Aderyn returned 60 records of priority plant species listed on Schedule 8 of the Wildlife and Countryside Act 1981. All records are of bluebell (*Hyacinthoides non-scripta*), the closest record dating from 2015 is located 20 m from the Site, just north of the railway bridge at Ryeland Lane, near Begelly.

No notable plant species were observed during the survey, and as such notable plants are not considered a receptor to the proposed works and will not be considered further in this report.

Invasive Non-Native Species

Aderyn returned 270 recent records of plant INNS (as listed in Schedule 9 of the Wildlife and Countryside Act 1981) from within 2 km of the Site. Species comprise Indian balsam (*Impatiens glandulifera*), Japanese knotweed, Montbretia (*Crocosmia pottsii x aurea*), New Zealand pigmyweed (*Crassula helmsii*), parrot's-feather (*Myriophyllum aquaticum*), Porphyra, seaweed (*Porphyra* sp.) rhododendron (*Rhododendron ponticum*), three-cornered garlic (*Allium triquetrum*) and wall cotoneaster (*Cotoneaster horizontalis*).

Several stands of Japanese knotweed were recorded within the Site (see Target Notes within Ecological Constraints and Opportunities Plan for locations). Stands were small and relatively sparse, with several patches with fewer than five stems present. Himalayan balsam was recorded in cess ditches and in locations around culverts, where the damp conditions allow them to proliferate.

Himalayan honeysuckle (*Leycesteria Formosa*) was observed in several locations near to Kilgetty. It is a non-native species and can be invasive, but is not listed under Schedule 9. It is not an offence to cause its spread, however care should be given to prevent the spread of the species in order to provide a positive impact upon local biodiversity.

Several stands of cherry laurel were also noted during the survey. Cherry laurel is a shade-tolerant species and can become dominant in the understorey of woodland. This species is of value for nesting birds; however, it can shade out other understory species and as such is considered that the ecological impacts outweigh the potential benefits it provides. Where possible cherry laurel should be removed in order to provide a positive impact upon local biodiversity.

INNS are present across the Site and as such are considered a receptor to the proposed works.

Tree Preservation Orders

Tree Preservation Order (TPO) data is held at the local authority level. Pembrokeshire County Council was contacted directly and the Pembrokeshire Coast Mapping software and Carmarthenshire County Council “My Nearest- Planning information” mapping website (https://www.carmarthenshire.gov.wales/ home/council-services/planning/my-nearest-planning-information/#.XAaFxtJLGM8) was consulted to obtain records for TPO located in proximity to the railway.

The Carmarthenshire Council mapping software returned no records of TPOs located within, or directly adjacent to, the Site. Pembrokeshire Council returned five records of TPOs within, or directly adjacent to, the Site, of which two have potential to be impacted by works. The details of these are provided in Table 5 below.

It is considered that where TPOs are located outside of the Network Rail boundary, they do not represent an ecological constraint, providing that clearance works are confined to the Network Rail ownership boundary. However, where TPOs are located within the Network Rail ownership boundary, there is potential for works to impact on these trees; therefore, TPOs are considered to be a receptor to the proposed works.

Table 5. Tree Preservation Orders in proximity to the Site.

Location	Mileage	Additional information	Potential impact
High mileage entrance to Narbeth Tunnel	264.0610 to 264.1000	TPO area covers all woodland area to the north of the line and surrounding the tunnel portal, outside of Network Rail (NR) ownership boundary.	No (if works are within NR boundary)
Templeton	266.1615 to 267.0050	TPO area covers several sycamores, located at the western crest of the railway cutting.	Yes- if works extend to crest of cutting
Templeton	267.0050	Single tree located on the boundary line to the adjacent property at the eastern crest of the cutting.	Yes- if works extend to crest of cutting.
Between Templeton and Kilgetty	268.0680 to 268.0700	TPO 7. The TPO area covers a deciduous woodland, of which a small section is located outside of the NR boundary to the northeast of the railway line.	No (if works are within NR boundary)
Northwest of Tenby	Several woodland compartments located between 272.0900 to 273.0880	TPO 12- comprising several pockets of deciduous and mixed woodland located outside of the NR boundary, on both sides of the line, as follows: W1 -west of line from 272.0900 to 273.0000 W2- east of line from 272.1390 to 273.0000 W4- west of line from 273.0070 to 273.0490 W5 -east of line from 273.0400 to 273.0620 W6- west of line from 273.0550 to 273.0760 W7- west of line from 273.0800 to 273.0815, and at 273.0880	No (if works are within NR boundary)

A9 Ecological Constraints and Opportunities

Proposals

The proposed works comprise vegetation management on the trackside vegetation present between Whitland and Tenby. The exact scope of works has not been confirmed at present however works will be one of the following two options:

- Selective removal of all 'high risk' Tier 1 and 2 trees, and removal of any dead, decaying or dying trees considered to pose a risk to the rail, as determined through an arboriculture assessment. These trees will be selected for removal based upon their likelihood of failure onto the line, and the risk posed to rail safety resulting from this.
- Removal of all tree species complying with the new Network Rail Standard NR/L2/OTK/5201/02 for vegetation management, which requires the area extending from 45° upwards from the outer running rail to be clear of tree species, as illustrated in the figure below.

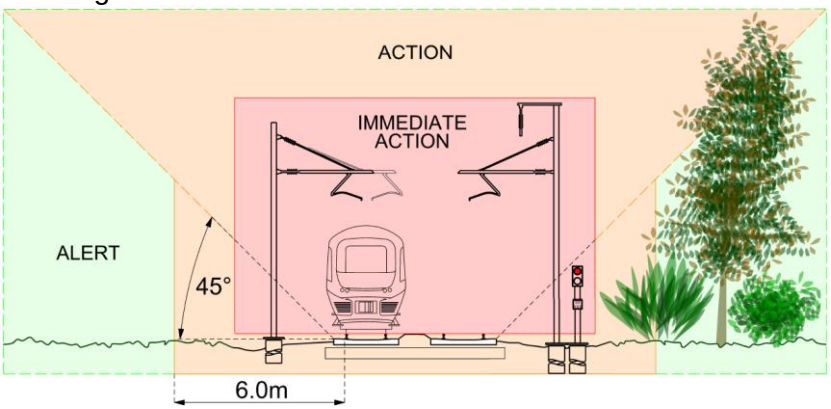

Figure 2: Vegetation management specification as outlined in the NR standard NR/L2/OTK/5201/02.

The proposed works will target trees species, but will retain any scrub, smaller shrub species or other vegetation with a short sward height, which does not pose a risk to safety through tree fall or a trip hazard within the cess area, where a safe walking route is required.

Tree stumps will be treated with eco-plugs, or stump sprayed with glyphosate to prevent regrowth, however widespread herbicide treatment will not be applied to the ground. As such once vegetation clearance on the high risk trees is complete, the habitat will be left to re-establish and vegetation regrowth will be able to commence immediately. As such works are anticipated to result in a modification of the habitats present, rather than permanent loss.

Constraints and Opportunities Table

Utilising data from the desk study and site visit, the ecological constraints of the proposed works have been identified. These are detailed within the Ecological Constraints and Opportunities Table in Table 6 below. Mitigation measures to be actioned during works have also been identified, as well as recommendations for enhancements. An Ecological Constraints and Opportunities Plan is provided in the Executive Summary, to illustrate location of mitigation and enhancement measures.

The scope of works to be employed has not been confirmed, however it is recommended that Option 1 outlined above which targets high risk trees only is employed. Option 1 would result in substantially less vegetation removal, and as a result, it is anticipated that Option 1 would have a smaller negative impact upon ecological receptors. However, to ensure a robust evaluation of impacts, the assessment below is based upon a 'worst case scenario' and a greater level of vegetation clearance presented by the second option.

In addition to species specific mitigation and enhancement measures, a “Tool Box Talk” (TBT) will be provided to contractors prior to commencement of works on Site. The TBT will outline how to identify the species considered likely to be present on Site and actions to take if they are discovered during works.

Ecological best practice guidance for vegetation management works is provided in Appendix 4. The guidance outlines key measures to be implemented on all sites during the vegetation management works, irrespective of their ecological ‘risk rating’, outlined within the ecological constraints spreadsheet and ECOPs.

Enhancement measures

The following ecological enhancement measures are recommended for the site:

- Creation of purpose-built log piles and brash piles from cut material generated from vegetation works under the guidance of an Ecologist.
- Creation of a “dead hedge” from material generated from vegetation management works, to maintain connectivity between the retained areas of vegetation at strategic locations under the guidance of an Ecologist.
- Installation of bat roosting boxes and bird nesting boxes, in suitable locations outside of the clearance area under the guidance of an Ecologist.
- Supplementary planting of native and ecologically valuable small tree and shrub species which complement the local native species and habitats.
- Supplementary planting of native hedgerow species to infill gaps in existing hedges, enhance and connect existing hedgerows and be proportionate. This will be informed by the arboricultural survey which will inform a detailed replanting plan. Any planting to offset will be located in suitable locations where future vegetation management will be nominal (e.g. the habitat will not be disturbed by future works).
- Removal of non-native species such as cherry laurel and Himalayan honeysuckle where possible.
- Mapping of non-native invasive species will be updated where new areas are identified. Removal of non-native invasive species will be scoped, and where there are viable options or areas highlighted as being high-risk (i.e. risk of spread to adjacent property) to control through long-term management, an INNS management plan will be produced.

Table 6: Ecological Constraints and Opportunities table, to be read in conjunction with the Constraints and Opportunities Plan

Receptor	Potential constraint	Actions / recommendations to mitigate constraints	Enhancement opportunities	Timing
Designated Sites				
Pembrokeshire Bat Sites and Bosherton Lakes SAC	SAC is located 1.6 km from Site, which has lesser horseshoe listed as a qualifying feature for site selection, which may represent a potential constraint to works.	Where works are within 10km of the SAC, a Habitat Regulations Assessment (HRA) Screening report should be prepared to identify the likely impacts of the proposed works on the SAC, (both alone and in combination) with other projects, and should consider whether impacts are likely to be significant. If the screening assessment indicates a significant impact is considered likely, a full Appropriate Assessment will be required. Consultation with NRW is recommended for the scope of the assessment.	-	Mitigation: Prior to works commencement
Limestone Coast of South West Wales SAC	SAC is located 2.2 km from Site, which has greater horseshoe listed as a primary reason for selection, which may represent a potential constraint to works.		-	Mitigation: Prior to works commencement
Carmarthen Bay and Estuaries SAC	SAC is located 360 m east at closest point, which has otter listed as a qualifying feature, which may represent a potential constraint to works. However, at the closest point the Site is separated from the SAC by the town of Tenby, which provides a significant barrier to otter movement. The closest point where there is no significant barrier to otter movement is approximately 1.6 km from the SAC.	A pre-works site walkover by an Ecologist should be carried out to identify whether additional otter holts have been established. in relation to working around watercourses be employed. Works should ensure that there is no break in vegetation connectivity around watercourses, which may deter otter movement. It is recommended best practice methodologies (e.g. pollution prevention measures) No herbicides should be used within 5 m of a waterbody without prior permission from NRW with only glyphosate being used in areas identified as having Biodiversity interest. Steps should be taken to ensure that material arisings from vegetation clearance (i.e. chippings / brash) and chemicals are not discharged into waterbodies.	-	Mitigation: Throughout works.
Habitats				
Woodland - including restored Ancient Woodland.	Vegetation management works comprising removal of trees within woodland habitats, including ancient woodland. Lowland mixed deciduous woodland is a habitat of principal importance under Section 7 of the Environment (Wales) Act.	It is recommended that works are limited to removal of high risk trees and those needed to facilitate works only. Smaller trees, shrubs and understorey to be retained wherever possible. Herbicide treatment limited to treating stumps. Exclusion zones to be in place around INNS to prevent spread. NRW will be consulted for any works to be undertaken within 3rd party woodland, and further mitigation will be agreed, where necessary.	Selective removal and treatment of INNS (cherry laurel and Japanese knotweed), within works area and wider NR owned woodland. Supplementary planting of native shrub species in appropriate locations.	Mitigation: Throughout works. Enhancement: Following completion of management works.
Hedgerows	Vegetation management works may require potential loss of hedgerow habitat and associated standard trees. Hedgerow is a habitat of principal	It is recommended that works are limited to removal of high risk trees and those needed to facilitate works only. Hedgerows should be retained wherever possible, especially where they form a boundary between adjacent land use.	Enhancement of retained hedgerows through infill planting of gaps with native hedgerow local species or hedgerow laying, to increase	Mitigation: Throughout works. Enhancement:

	importance under Section 7 of the Environment (Wales) Act.	Herbicide treatment on standard trees limited to treating stumps.	density and fill gaps. Supplementary planting could be undertaken to connect retained hedgerow with other important habitats (e.g. woodland) along the railway corridor.	Following completion of management works.
Watercourses	Vegetation management works may require herbicide application to vegetation. There is a risk of pollution to watercourses, without appropriate pollution prevention methods.	Pollution prevention measures must be adhered to when working in proximity to watercourses. No herbicides are to be used within 5 m of a watercourse. Only pesticides approved for use in or near water may be used when working in proximity to water courses. Herbicide treatment limited to treating stumps and using glyphosate by suitably qualified staff. The operators must comply with all requirements of the herbicide product label. Ensure that material arisings from vegetation clearance (i.e. chippings / brash) and chemicals are not discharged into waterbodies. Biodegradable fuels should be used with hand-held machinery.	NA	Mitigation: Throughout works.
Other habitats: scrub, semi-improved grassland, bracken, introduced shrub	Dependent on the scope of works, works may require removal of the habitats listed to the left. These habitats are not listed as habitats of principal importance under Section 7 of the Environment (Wales) Act, or Annex 1 Habitats of the Habitats Directive. However, they offer habitat of value to various species that may be present on Site.	It is recommended that works are limited to removal of high risk trees and those needed to facilitate works only. Smaller trees, shrubs and other short sward height vegetation to be retained wherever possible. Herbicide treatment limited to treating stumps and using glyphosate by suitably qualified staff. Exclusion zones to be in place around INNS to prevent spread. Permission from NRW required for herbicide treatment within or adjacent to a watercourse.	Selective removal and treatment of INNS within works area and wider NR owned land. Supplementary planting of scrub/ shrub species in suitable locations, to provide connectivity across railway corridor. Sow species rich wildflower seed mixes on retained grassland habitats to increase species richness.	Mitigation: Throughout works. Enhancement: Following completion of management works.
Tree Preservation Orders TPO	TPOs are in place for trees within the NR ownership boundary. It is an offence to cut down, lop, uproot, intentionally damage or destroy a tree without prior consent from the Local Authority.	Works to avoid trees with TPOs. TPOs within clearance area, should be demarcated and care taken to avoid damage during works. Should removal or management or TPO be unavoidable (for example require removal due to safety considerations), permission must first be obtained from the relevant Local Authority prior to woks commencing.	Enhancements to be advised by Local Authority. Possible enhancements include replacement of trees with sapling/ standard trees of the same species, where appropriate.	Mitigation: Permission for works to TPO must be sought prior to any actions to TPO trees.
Species				
Amphibians (common	Partially protected under the Wildlife and Countryside Act 1981.	Works to be undertaken employing a method sensitive to amphibian presence; this will incorporate the following best	Creation of dedicated log / brash piles on Site from	Mitigation: Throughout

species)	Potential for common amphibian presence within the works area, in particular utilising log / brash piles for shelter and foraging within grassland / scattered scrub habitats. Works may result in killing / injury to common amphibians and loss of habitat.	practice: • Existing log / brash piles to be retained where possible. • Any existing log / brash piles to be moved must be dismantled by hand to search for amphibians prior to removal under the supervision of an Ecologist. • Where 'to ground' clearance is required, a two-stage methodology should be employed under guidance from an Ecologist: vegetation should be cut to 30 cm utilising hand tools only. The area should be left for 24 hours to allow amphibians to leave the area, and then following a visual inspection for reptiles, the remainder of the vegetation can be removed to ground. A Tool Box Talk to be provided to contractors prior to works commencement.	material arising from works, to provide additional sheltering and hibernating habitat.	works. Enhancement: During works, following vegetation removal activities.

		commencement.		
Bats	All UK bat species are included in Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended). Under regulation 41 bats are protected from deliberate capture, injury or killing, from deliberate disturbance and from deliberate damage or destruction of a breeding site or resting place. Site offers suitable foraging and commuting habitat. Several trees were considered to provide suitable roosting habitat. Works have potential to result in loss of potential roosts, as well as foraging and commuting habitat.	Wherever possible trees with bat roost potential should be retained. Further survey is required on trees with 'moderate' or 'high' bat roost potential, that are subject to removal. Survey to comprise an endoscopic inspection by a licenced ecologist or nocturnal activity surveys (two for 'moderate' trees and three for 'high' potential trees) to be undertaken during the active bat season (May – August inclusive), following methodology outline within best practice guidelines (Collins, 2016). The surveys will inform if there is a need (or not) for a European Protected Species Licence (EPSL) to remove the trees or additional mitigation actions, where required.	Installation of dedicated bat boxes on suitable trees outside of the clearance area, but within the NR owned land. Bat boxes should be placed on the southern face of trees, at a minimum of 4 m from the ground, ideally located away from significant light spill.	Surveys completed prior to works commencement.
		A precautionary method should be employed in removal of trees with 'low' bat roost potential. This will require sectional felling of the tree, whereby first the ivy will be hand stripped and additional roost features (e.g. cavities or rot hollows) be searched for. The tree limbs can then be carefully removed, and lowered to the ground (using ropes or grabs), where they should be left in place for at least 24 hours, with any cavities facing outwards, so any bats present have opportunity to leave. Trees should be removed following best practice methodology, as follows: • Dense ivy should be stripped by hand where possible, to allow inspection for roost features beneath. • Contractors should avoid cutting through cavities in the trunk and limbs, instead position cut suitably far above or below the cavities. • Large plates of flaking bark should be removed by hand where possible, to allow for inspection for any bats present behind. • Trees with features should be "sectionally felled" where the limbs and trunk are lowered to the ground and left in place for at least 24 hours, with the cavity facing outwards, so any bats present have opportunity to leave. If there is concern that bats may be present within features not previously identified, work to the tree must stop and the 'on call' ecologist contacted for advice.		Mitigation: Throughout works. Enhancement: Following completion of works in a section.

		Works lighting will be positioned to avoid light spill onto areas outside of the works site. A “Tool Box Talk” to be provided to contractors prior to works commencement.		
		Works should aim to minimise the level of clearance wherever possible, targeting only trees considered of risk to the rail safety, to minimise loss of bat foraging and commuting habitat. Other vegetation, for example low scrub habitat and other vegetation should be maintained.	Bats may benefit from other supplementary planting as described above.	Mitigation: Throughout works.
Birds	It is an offence to damage or destroy active nests or disturb nesting birds under the Wildlife & Countryside Act 1981 (as amended). Suitable habitat for nesting birds on and around the works site. Potential for breeding birds and nests to be present and disturbed by proposed works.	Vegetation management works should be undertaken outside of the nesting bird season (March to August inclusive). If this is not possible, a nesting bird check will be undertaken immediately prior to vegetation removal, following the requirements of the Network Rail ‘Breeding Bird and Nest Check Form’. If nesting birds are found within the works area, an exclusion zone will be installed around the nest in line with Network Rails nesting bird check procedure (2019). No works can be undertaken within the exclusion zone until the chicks have fledged (to be determined by a suitably qualified ecologist). A “Tool Box Talk” to be provided to contractors prior to works commencement.	Installation of a variety of bird nest boxes within the woodland outside of the works area. Nest boxes should be placed at a minimum of 3 m from the ground, in several locations, at a variety of aspects. South facing aspects have potential to overheat however if in direct sunlight, so should be avoided.	Mitigation: Nesting bird check to be completed prior to works commencement. Enhancement: Following completion of works.
Hazel dormouse	Dormouse are protected under the Conservation of Habitats and Species Regulations 2010 (as amended) and Wildlife & Countryside Act 1981 (as amended). Potential for dormouse presence within suitable woodland and dense scrub habitat. Works may result in killing / injury / disturbance to dormice and loss of habitat.	A presence/ absence survey must be undertaken within suitable woodland and scrub habitat, in particular in the area in proximity to the dormouse recorded highlighted by the data consultation. Consultation with NRW should be sought to inform the scope of the surveys. The surveys will inform any requirement for an EPSL to carry out the works or additional mitigation actions, where required.	Enhancements dependent on results of dormouse presence/ absence survey.	Presence / absence survey to be completed and an EPS licence granted (if required) prior to works commencement.
Reptiles	Partially protected under the Wildlife & Countryside Act 1981 (as amended). Potential for reptile presence within the works area, in particular utilising log / brash piles for shelter, or foraging in grassland	Existing log / brash piles to be retained where possible. Any existing log / brash piles to be moved must be dismantled by hand to search for reptiles prior to removal.	Creation of dedicated log / brash piles on Site from material arising from works, to provide additional sheltering and hibernating habitat	Mitigation: Throughout works. Enhancement: During works,

	habitat. Works may result in killing / injury / disturbance to reptiles and loss of habitat.	Where 'to ground' clearance is required, a two-stage methodology should be employed under guidance from an Ecologist: vegetation should be cut to 30 cm utilising hand tools only. The area should be left for 24 hours to allow amphibians to leave the area, and then following a visual inspection for reptiles, the remainder of the vegetation can be removed to ground. A "Tool Box Talk" to be provided to contractors prior to works commencement.		following vegetation removal activities.
Otter	Protected under the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife & Countryside Act 1981 (as amended). Works are not anticipated to impact on waterbodies. Vegetation removal may result in disturbance to otters.	A pre-works site walkover should be carried out by an Ecologist to identify whether otter are present / using habitats within the Site. A "Tool Box Talk" to be provided to contractors prior to works commencement. It is anticipated that waterbodies will not be impacted by the proposed works, however it is recommended that best practice methodologies for working around watercourses be employed. No herbicides should be used within 5 m of a waterbody without permission from NRW, and steps should be taken to ensure that material arisings from vegetation clearance (i.e. chippings / brash) and chemicals are not discharged into waterbodies	NA	Mitigation: Throughout works.
Hedgehog	Partially protected under the Wildlife & Countryside Act 1981 (as amended). Listed on Section 7 of the Environment (Wales) Act 2016 as a "species of principal importance", for which public bodies have a duty to conserve. Potential for hedgehog presence within the works area, in particular utilising log / brash piles for shelter. Vegetation clearance works may result in disturbance to hedgehogs and loss of habitat.	Any existing log / brash / leaf litter piles that need to be disturbed or moved must be dismantled by hand prior to removal, under the supervision of an Ecologist. A "Tool Box Talk" to be provided to contractors prior to works commencement.	Creation of dedicated log / brash piles on Site from material arising from works, to provide additional sheltering and hibernating habitat.	Mitigation: Throughout works. Enhancement: During works, following vegetation removal activities.
Polecat	Partially protected under the Wildlife & Countryside Act 1981 (as amended). Listed on Section 7 of the Environment (Wales) Act 2016 as a "species of principal importance", for which public bodies have a duty to conserve.	Suitable habitat (woodland, grassland, scrub etc) should be retained, where possible. Works should be undertaken with hand tools only (chainsaws and brush cutters), to allow polecats to vacate daytimes resting sites if present.	Recommended supplementary planting in woodland, scrub and hedgerow habitats are considered to be of value to polecat.	Mitigation: Throughout works. Enhancement: During works, following vegetation

	Potential for polecat presence within the works area. Vegetation clearance works may result in disturbance to polecats and loss of habitat.	A "Tool Box Talk" to be provided to contractors prior to works commencement.		removal activities.
Invasive Non-Native species (INNS)	It is an offence under the Wildlife and Countryside Act 1981 (as amended) to "plant or otherwise cause to grow in the wild" any plant species listed in Schedule 9 of the Act. Japanese knotweed and Himalayan balsam recorded across the works Site. Clearance works have potential to result in spread of INNS.	Invasive species management and treatment should be undertaken using glyphosate by suitably qualified individuals. Where this is not possible an exclusion zone (minimum 7 m) will be set up by a suitably qualified ecologist around stands of Japanese knotweed and Himalayan balsam prior to works commencement. No works will be undertaken within the exclusion zone. Best practice biosecurity measures for working in proximity to INNS should be followed.	Treatment and removal of other invasive species (cherry laurel and Himalayan honeysuckle) to enhance the wider woodland and scrub habitat.	Mitigation: Throughout works. Enhancement: Throughout works.

A10 Conclusions

The Extended Phase 1 habitat survey and desk study have indicated that the following ecological receptors represent ecological constraints to the proposed vegetation clearance works to be undertaken on Site.

- Designated sites: Pembrokeshire Bat Sites and Bosherton Lakes SAC and Limestone Coast of South West Wales SAC;
- Amphibians (common species);
- Badger;
- Bats;
- Birds;
- Hazel dormouse;
- Reptiles;
- Otter;
- Hedgehog;
- Polecat; and
- Invasive Non-Native Species.

The assessment has highlighted that a Habitat Regulations Assessment (HRA) Screening report should be prepared to identify the likely impacts of the proposed works on the SACs, either alone or in combination with other projects. The HRA should consider whether impacts to the designated sites are likely to be significant and will inform the requirement for a full Appropriate Assessment.

The assessment has highlighted the requirement of further survey of trees with moderate and high bat roost potential. This will require either an endoscope survey of the potential roost features, or nocturnal activity surveys (two or three dusk / dawn surveys, for moderate and high roost potential respectively), which must be undertaken at an appropriate time of year (May to August inclusive). Surveys must be undertaken by a suitably licenced ecologist, who will be able to advise further actions following the survey.

Further species-specific surveys will be required to determine the presence or likely absence of hazel dormice within suitable habitat within the works area. Nest tubes surveys should be undertaken by a suitable licenced ecologist, in line with best practice guidance at the appropriate time of year (April to November inclusive). It is recommended the scope of survey works be agreed with Natural Resources Wales prior to survey commencement.

Species specific mitigation measures have been provided within Section A9. An Ecological Constraints and Opportunities Plan has been produced to graphically represent the main mitigation measures and outline the enhancement areas. This figure should be made available to contractors when carrying out works and should be used to inform the works on Site.

The information provided within this report is considered valid for a period of two years from the date of the Site visit. If works have not been completed by this date, it is recommended the Site be re-surveyed, to determine the ecological status of the Site.

A11 References

CIEEM (2017). Guidelines for Preliminary Ecological Appraisal produced by the Chartered Institute of Ecology and Environmental Management.

Collins, J (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

DEFRA (2012). Technical Paper: the metric for the biodiversity offsetting pilot in England. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69531/pb13745-bio-technical-paper.pdf

Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746

Geo-RIMN viewer. Network Rail.

Google Maps https://www.google.co.uk/maps

Joint Nature Conservation Committee. (2003). Handbook for Phase 1 Habitat Survey – a technique for Environmental Audit. Joint Nature Conservancy Committee. Peterborough.

Joint Nature Conservation Committee (JNCC) UK BAP Priority Species. http://jncc.defra.gov.uk/page-5717

Joint Nature Conservation Committee (JNCC) UK BAP Priority Habitats. http://jncc.defra.gov.uk/page-5718

Lle Geo-portal (Welsh Government) http://lle.gov.wales/map

Multi-agency Geographical Information for the Countryside (MAGIC) (2000). http://magic.defra.gov.uk/website/magic/

Network Rail (2017). Rail Biodiversity Calculator. https://safety.networkrail.co.uk/home-2/environment-and-sustainable-development/environment/ecology-biodiversity/biodiversity-calculator/

NRW (2018). Badgers- A Guide for Developers. Natural Resources Wales https://naturalresources.wales/media/684003/badger-fact-sheet-for-developers-english.pdf .

PTES (2016). The State of Britain's Dormice 2016. PTES https://ptes.org/wp-content/uploads/2016/09/State-of-Britains-Dormice-2016.pdf

A13 Appendices

Appendix 1 – Summary of Legislation

Amphibians

Common amphibians are protected under the Wildlife and Countryside Act 1981 (as amended) from activities related to their sale and it is considered best practice to avoid harming or killing them.

In addition, rare amphibian species; natterjack toad and great crested newt are listed under The Conservation of Habitats and Species Regulations (2017). This makes it an offence to;

- Capture, kill, injure and disturb;
- Take or destroying eggs;
- Damage or destroy breeding/resting places;
- Obstruct access to resting places; and
- Possess, advertise for sale, sell or transport for sale, live or dead (part or derivative).

Common toad, natterjack toad and great crested newt are also listed as Species of Principal Importance under Section 7 of the Environment (Wales) Act 2016 as a species of principal importance, for which public bodies have a duty to conserve.

Bats

All UK bat species are fully protected in UK legislation. They are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and as such are protected from:

- Intentional or reckless killing, injury, taking;
- Damage to or destruction of or, obstruction of access to any place of shelter, breeding or rest;
- Disturbance of an animal occupying a structure or place;
- Possession or control (live or dead animals);
- Selling, bartering or exchange of these species, or parts of.

These are also protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017, which transposes the EU Habitat Regulations. The regulations protect against:

- Deliberate killing, injuring or taking of bats;
- Deliberate disturbance of any bat species in such a way as to be significantly likely to affect:
  - their ability to survive, hibernate, migrate, breed, or rear or nurture their young; or
  - the local distribution or abundance of that species.
  - damage or destruction of a breeding site or resting place;
  - the possession or transport of bats or any other part of.

Several bat species are also listed as “Species of Principal Importance” under Section 7 or the Environment (Wales) Act 2016. These species are; barbastelle, brown long-eared, greater horseshoe, lesser horseshoe, noctule and soprano pipistrelle bats.

Badger

Badgers and their setts are protected under the Protection of Badgers Act 1992. It is an offence under the act to:

- Kill, injure or take a badger.

- Destroy, damage or obstruct a currently active badger sett,
- Disturb a badger within the sett.

Birds

All nesting birds are protected under the Wildlife and Countryside Act 1981. Under this legislation, it is an offence to:

- Kill, injure or take any wild bird
- Take, damage or destroy the nest of any wild bird whilst it is in use or being built
- Take or destroy the egg of any wild bird
- Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Hazel dormouse

Hazel dormice are fully protected in UK legislation. They are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and as such are protected from:

- Intentional or reckless killing, injury, taking;
- Damage to or destruction of or, obstruction of access to any place of shelter, breeding or rest;
- Disturbance of an animal occupying a structure or place;
- Possession or control (live or dead animals);
- Selling, bartering or exchange of these species, or parts of.

These are also protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017, which transposes the EU Habitat Regulations. The regulations protect against:

- Deliberate killing, injuring or taking of hazel dormice;
- Deliberate disturbance of the species in such a way as to be significantly likely to affect:
  - their ability to survive, hibernate, migrate, breed, or rear or nurture their young; or
  - the local distribution or abundance of that species.
  - damage or destruction of a breeding site or resting place;
  - the possession or transport of dormice or any other part of.

Hazel dormice are also listed as “Species of Principal Importance” under Section 7 or the Environment (Wales) Act 2016.

Otter

Otters are fully protected in UK legislation. They are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and as such are protected from:

- Intentional or reckless killing, injury, taking;
- Damage to or destruction of or, obstruction of access to any place of shelter, breeding or rest;
- Disturbance of an animal occupying a structure or place;
- Possession or control (live or dead animals);
- Selling, bartering or exchange of these species, or parts of.

These are also protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017, which transposes the EU Habitat Regulations. The regulations protect against:

- Deliberate killing, injuring or taking;
- Deliberate disturbance of the species in such a way as to be significantly likely to affect:
- their ability to survive, hibernate, migrate, breed, or rear or nurture their young; or
- the local distribution or abundance of that species.
- damage or destruction of a breeding site or resting place;
- the possession or transport an otter or any other part of.

They are also listed as "Species of Principal Importance" under Section 7 or the Environment (Wales) Act 2016.

Reptiles

Common reptile species are partially protected under Schedule 5 (Sections 9(1) and 9(5)) of the Wildlife and Countryside Act 1981 (as amended). This legislation protects these animals from:

- Reckless or intentional killing and injury;
- Selling, offering for sale, possessing or transporting for the purpose of the sale or publishing advertisements to buy or sell a protected species.

In addition, rare reptile species; sand lizard and smooth snake are listed under The Conservation of Habitats and Species Regulations (2017). This makes it an offence to;

- Capture, kill, injure and disturb;
- Take or destroying eggs;
- Damage or destroy breeding/resting places;
- Obstruct access to resting places; and
- Possess, advertise for sale, sell or transport for sale, live or dead (part or derivative).

Slow worm, sand lizard, common lizard, grass snake and adder are also listed as Species of Principal Importance under Section 7 of the Environment (Wales) Act 2016 as a species of principal importance, for which public bodies have a duty to conserve.

Hedgehogs

Hedgehogs receive partial protection under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended), which protects them against certain methods of killing or taking.

Hedgehogs are listed as Species of Principal Importance under Section 7 of the Environment (Wales) Act 2016 as a species of principal importance, for which public bodies have a duty to conserve.

Polecat

Polecats receive partial protection under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended), which protects them against certain methods of killing or taking.

They are also listed as Species of Principal Importance under Section 7 of the Environment (Wales) Act 2016 as a species of principal importance, for which public bodies have a duty to conserve.

Invasive non-native species

In the UK it is an offence under the Wildlife and Countryside Act 1981 (as amended) to "plant or otherwise cause to grow in the wild" any plant species listed in Schedule 9 of the Act.

Appendix 2 – Trees with bat Roost Potential

GPS ref	Up/ Dn side	Miles	Yards	NR land/ 3rd party	Tree no	Sub-feature letter	Tree species	Feature height and orientation		Feature BRP	Description	Overall BRP
B1	Up	259	453	NR	1	a	Willow	1.5	SE	LOW	Small hole around 2cm wide in a narrow limb	LOW
B2	Up	259	628	NR	2	a	Willow	2	S	LOW	Small hole in limb, can see through to other side, doesn't look as if there is a cavity suitable	LOW
B2	Up	259	628	NR	2	b		2	S	LOW	Thin cavity which may extend into the limb, however limb very narrow (15cm width), so unlikely to offer much potential	
B3	Up	259	679	NR?	3	a	Willow	3	SW	LOW	Cleft in trunk located on dead limb, doesn't appear to lead anywhere and very thin	LOW
B4	Up	259	1254	NR	4	a		3	E	MOD	Cleft in trunk with rotten heartwood and branch tear, but open to the weather, may offer a small cavity	MOD
B5	Up	259	1634	NR	5	a	Willow	2	N	LOW	Where main stem has snapped and fallen but still attached, a small gap is present (like hazard beam), however is very thin	LOW
B6	Dn	259	1718	NR	6	a	Willow	To 4m	-	LOW	Ivy cover on tree, however general condition of tree good with no obvious features present	LOW
B7	Dn	260	250	NR	7	a	Sycamore	-	NA	LOW	Thin ivy cover low on stem but little potential. No obvious features present, however main stem dead (no bark present) and given size and characteristics assessment LOW recommended with soft felling undertaken as a precaution	LOW
B7	Dn	260	266	NR	8	a	Dead	2	NW	MOD	Possible cavity in trunk and further along branch where split present. However, tree is small. Could be endoscoped from the ground with extension cable.	MOD
B8	Dn	260	296	3rd	9	a	English oak	1.5	W	MOD	A large mature tree, with reasonable condition given age. Where limbs have been cut, there is potential for the wood to have rotted which may leave cavities extending into the limbs. Dead limb present on south side which may lead to a cavity at 1.5m from the ground.	MOD
B9	Up	260	683	3rd	10	a	English oak	1.5	E	MOD	Dead branch break midway along branch, with potential for cavity inside, however end open upwards to rain which may reduce suitability	MOD
B10	Dn	260	852	NR	11	a	Willow	3.5	N	MOD	Small knot hole in limb, which may extend into cavity. Two torn branches also present, but very thin.	MOD
B11	Dn	260	912	NR	12	a	Willow	2.5	E	MOD	Hole in trunk approx. 5cm wide, which may extend into cavity	MOD
B11	Dn	260	912	NR	12	b		2	N	LOW	Cleft which may extend into trunk at the top. Also, thin ivy cover present	
B12	Dn	260	1030	NR	13	a	Willow	3	S	MOD	Knot hole which may extend into trunk. Can't see inside from ground.	MOD
B12	Dn	260	1030	NR	13	b		3	N	LOW	At union between two stems possible space/crevice for a bat, but very limited if present.	
B13	Dn	260	1174	NR	14	a	Ash	3.5	N	MOD	Knothole at past limb break/drop, potential to extend into trunk, however open to rain.	MOD
B14	Dn	260	1327	NR	15	a	Oak	1.5	S	MOD	Tear out but facing away from track, so unable to see clearly. Requires further survey/endoscope to confidently assess. Also second large tear out on tree, but no crevices for bats to roost, hence negligible potential.	MOD
B15	Dn	260	1591	3rd	16	a	Oak	2.5	N	MOD	Knot hole in limb	MOD
B15	Dn	260	1591	3rd	16	b		2.75	NW	MOD	Gap beneath bark where heartwood is rotten provides small crevice.	
B16	Dn	260	1599	3rd	17	a	Ash	2.5	N	MOD	Cavity in trunk at horizontal split which may provide potential crevice.	MOD
B17	Dn	260	1599	3rd	18	a	Oak	1.5	E	LOW	Dead limb present, however no PRF visible. Ivy cover present on tree. Recommend ivy strip and soft fell as precaution.	LOW
B17	Up	260	1633	3rd	19	a	Alder	To 4	NA	LOW	Mod ivy cover, however general condition of the tree good with no PRF visible.	LOW
B18	Up	261	303	3rd	20	a	Oak	2.5	SW	MOD	Mature oak with several features. Knothole at limb drop, with possible cavity.	MOD
B18	Up	261	303	3rd	20	b	-	3.5	S	MOD	Knothole with possible cavity extending into limb	
B18	Up	261	303	3rd	20	c	-	3.5	SE	MOD	Possible cavity at split and rotten wood visible	
B18	Up	261	303	3rd	20	d	-	3.5	E	MOD	Cavity at knothole, plus several ripped branches where there is potential for crevices.	
B18	Up	261	303	3rd	20	e	-	4.5	N	MOD	Knot hole at limb drop with potential for cavity extending into trunk.	
B19	Up	261	376	NR	21	a	Un-ID	NA	NA	LOW	Ivy cover on tree. General condition of tree good with no other PBRF visible	LOW
B20	Dn	261	725	3rd	22	a	Oak	NA	NA	LOW	Ivy cover on tree. No PBRF visible, and condition good, however size and characteristics indicative of LOW.	LOW
B20	Dn	261	728	NR	23	a	Willow	3	S	LOW	Broken limb, however using binoculars can see into limb, which doesn't appear to extend anywhere	LOW
B20	Dn	261	728	NR	24	a	Willow	3	N	MOD	Split and possible cavity in trunk, which may offer some potential	MOD
B20	Dn	261	728	NR	24	b	-	3	N	LOW	Small cleft in trunk (approx. 7 cm long) which may extend into trunk, however cleft narrow (2cm)	

B21	Dn	261	843	NR	25	a	Willow	To 3	NA	LOW	Thin ivy cover over tree, some dead limbs present, but no obvious PBRF.	LOW
B22	Dn	261	994	NR	26	a	Ash	2.5	N	LOW	Rotten limb, with some limited potential for cavity present, however limb narrow	LOW
B23	Dn	261	1101	NR	27	a	Sycamore?	To 3	NA	LOW	Ivy cover with moderately thick stems, which may offer some roosting potential. Condition of tree mod, however no other PBRF noted. Recommend ivy strip and soft fell	LOW
B24	Dn	261	1192	NR	28	a	Willow	2	N	MOD	One of the multi-stems has previously been cut with stem left on cutting. Small cavity in cut stem on floor.	MOD
B24	Dn	261	1192	NR	28	b	-	4.5	N	MOD	Small cavity (3cm wide by 5 cm long) that may extend into trunk, however trunk fairly narrow (approx 20cm)	
B25	Dn	261	1210	NR	29	a	Several trees)	NA	NA	LOW	Several SM trees (mainly hawthorn and willow) with twisting limbs, with some limited potential for small crevices, however limited at best, extending from bridge t0 251.1255. Recommend soft fell.	LOW
B26	Dn	261	1258	NR	30	a	Willow	To 3.5	NA	LOW	Ivy cover and twisted limbs with potential for small crevices, but very limited potential	LOW
B27	Up	261	1289	NR	31	a	Oak	To 3	NA	LOW	Ivy cover on mature oak, no obvious features present and condition good, but size and characteristics of low potential.	LOW
B28	Dn	261	1473	NR	32	a	Ash	NA	NA	LOW	Some ivy cover and twisting on stems, offering limited potential at best. No other PBRF visible, but size and characteristics of low potential.	LOW
B29	Up	261	1473	NR	33	a	Alder	2.5	SW	LOW	Tear leaving split in dead limb, possible crevice but open to rain	LOW
B30	Dn	261	1503	3RD	34	a	Willow	2.5	E	LOW	Branch tear has occurred which has left a split, which may lead to crevice, but open to rain reducing suitability.	LOW
B31	Dn	262	55	3RD	35	a	Oak	2	N	MOD	Mature oak, with possible cavity at base of limb, plus ivy cover and limb drops which may lead to cavity.	MOD
B32	Dn	262	148	23RD	36	a	Oak	NA	NA	LOW	Thin ivy cover. No PBRF visible but size and characteristics of LOW.	LOW
B32	Dn	262	156	3RD	37	a	Willow	3.5	NE	MOD	Knothole with cavity possibly extended into limb	MOD
B32	Dn	262	156	3RD	37	b	-	3.5	N	MOD	Small cleft which may extend into cavity.	
B32	Dn	262	171	NR	38	a	Willow	2	N	MOD	Cavity in limb/ old split approx 5cm across, which may extend further into the limb.	MOD
B33	Up	262	272	NR	39	a	Oak	NA	NA	LOW	Tree already flailed. Some ivy cover, however general condition reasonable	LOW
B34	Up	262	307	3rd	40	a	Oak	2	S	HIGH	Large knothole (10cm across), extending into trunk. Some ivy cover also present.	HIGH
B34	Dn	262	309	3rd	41	a	Oak	NA	NA	LOW	No obvious features, but size and characteristics of LOW tree.	LOW
B35	Dn	262	398	NR	42	a	Willow	2.5	NE	MOD	Where stem snapped but still attached there is a split in the stem which may provide potential crevice	MOD
B35	Dn	262	398	NR	42	b		3	E	MOD	Small split in E facing branch, however branch very thin (5cm)	
B35	Dn	262	398	NR	42	c		NA	NA	MOD	Dense ivy cover which may conceal further features.	
B35	Dn	262	398	3rd	43	a	Oak	NA	NA	LOW	No obvious features present, however size and characteristic of Low tree. On 3rd party land, recommend further investigation if to be removed.	LOW
B35	Up	262	398	3rd	44	a	Oak	NA	NA	LOW	Dense ivy cover on lower part of tree, which may conceal features.	HIGH
B35	Up	262	398	3rd	44	b	-	1.5	SW	MOD	Exposed heartwood, with possible cavity at knothole	
B35	Up	262	398	3rd	44	c	-	1.5	SW	MOD	Exposed heartwood with thin splits, may offer crevice on the dead limb	
B35	Up	262	398	3rd	44	d	-	2.5	SE	MOD	Knothole into dead limb with potential for cavity	
B35	Up	262	398	3rd	44	e	-	2.75	E	HIGH	Gap present at dead limb drop, with potential to extend into a cavity in the limb	
B35	Up	262	398	3rd	44	f	-	4	S	MOD	Small knothole, appears to extend into thin (5cm) limb	
B35	Up	262	415	3rd	45	a	Oak	3.5	E	MOD	Old knothole and partially occluded wood. Small gap approximately 2-5cm across. Also ivy cover which conceals some areas.	MOD
B35	Up	262	415	3rd	45	b	Oak	1-2	W	MOD	Split in dead limb. Could be endoscoped from the ground.	
B36	Up	262	489	3rd	46	a	Oak	3.5	S	HIGH	Knothole with medium sized hole which clearly extends into limb.	HIGH
B36	Up	262	489	3rd	46	b	-	3.5	SE	HIGH	Knothole with medium sized hole which clearly extends into limb.	
B36	Up	262	489	3rd	46	c	-	3.5	E	MOD	Knothole with small sized hole which may extend into limb.	
B37	Dn	262	831	3rd	47	a	Ash	2	NE	HIGH	Small knothole appearing to lead into cavity	HIGH
B37	Dn	262	833	NR	48	a	Willow	2	NE	MOD	Cavity in bent limb. Can be endoscoped from the ground	MOD
B37	Dn	262	833	NR	48	b	-	2	E	MOD	Tear in trunk with exposed core and cavity.	
B37	Dn	262	843	3rd	49	a	Oak	NA	NA	LOW	Ivy cover on tree with thick stems No further PBRF visible.	LOW
B38	Dn	262	920	NR	50	a	Willow	NA	NA	LOW	Relatively dense ivy cover on tree, but general condition of tree good and no further PBRF visible.	LOW
B39	Dn	262	945	NR	51	a	Willow	1.5	W	MOD	Split in limb with heartwood exposed. Potential for crevice suitable for bat roosting.	MOD

B39	Dn	262	955-1076	NR	52	a	Collection of trees	NA	NA	LOW	Group of willow trees on cutting with some ivy cover. No other PBRF visible, but size and characteristics of low potential tree.	LOW
B40	Up	262	1675	3rd	53	a	Ash	5	S	MOD	Old limb knothole with branch collar, which may extend into cavity	MOD
B40	Up	262	1675	3rd	53	b	Ash	6	S	MOD	Old limb knothole with branch collar, which may extend into cavity	
B40	Up	262	1675	3rd	53	c	Ash	5	S	MOD	Old limb knothole with branch collar, which may extend into cavity	
B41	Dn	263	130	NR	54	a	Oak x 2	To 4m	NA	LOW	Ivy cover, some potential for gap beneath ivy.	LOW
B42	Dn	263	320	NR	55	a	Ash	To 4	NA	LOW	Ivy cover on tree, however tree in good condition with no visible features of decay, where trunk/limbs are exposed.	LOW
B43	Up	263	418	3rd	56	a	Ash	4	S	HIGH	Branch collar, where not possible to see clearly from ground, but may extend into cavity in limb.	HIGH
B43	Up	263	418	3rd	56	b	Ash	3.5	SW	HIGH	Branch collar, where not possible to see clearly from ground, but may extend into cavity in limb.	
B43	Up	263	418	3rd	56	c	Ash	3	SW	HIGH	Branch collar, where not possible to see clearly from ground, but may extend into cavity in limb.	
B43	Up	263	418	3rd	56	d	Ash	To 5	NA	LOW	Dense ivy extending up tree.	
B44	Dn	264	903	3rd	57	a	Beech	4	S	MOD	Where past branch cutting as occurred, a small cavity has developed in branch. Also flushcut presence but no cavity.	MOD
B45	Dn	264	940	3rd	58	a	Pine	4	S	LOW	Limb tear with possible cavity in thin branch, but limited roosting potential	LOW
B45	Dn	264	940	3rd	59	a	Pine	2	S	LOW	Limb tear with possible cavity in thin branch, but upward facing, so exposed to rain	LOW
B46	Dn	264	1013	NR	60	a	Un-ID conifer	To 5m	na	LOW	Thin ivy cover over majority of tree, however tree in good condition with no visible features of decay, where trunk/limbs are exposed.	LOW
B46	Dn	264	1013	NR	61	a	Dead tree - no ID	4	S	MOD	Dead tree, with cavity potentially extending into branch, but open upwards so exposed to weather and open to rain.	MOD
B46	Dn	264	1013	NR	61	B	Dead tree - no ID	3	W	HIGH	Knothole into main trunk on dead tree	HIGH
B47	Dn	264	1198	NR	62	a	Pine	To 5	-	LOW	Dense ivy on tree, however tree in good condition with no visible features of decay, where trunk/limbs are exposed.	LOW
B48	Dn	264	1230	NR	63	a	Pine	3.5	E	LOW	Dead limb with possible cavity, but open upwards to rain, reducing suitability.	LOW
B49	Dn	264	1285	NR	64	a	Pine	4	E	MOD	Dead limb with possible cavity, but open upwards to rain, reducing suitability.	MOD
B49	Dn	264	1285	NR	64	b	Pine	4	SE	LOW	Dead limb with very small cavity	
B50	Dn	264	1525	NR	65	a	Cedar	To 5	NA	LOW	Ivy cover on tree, however tree in good condition with no visible features of decay, where trunk/limbs are exposed.	LOW
B51	Dn	264	1690	NR	66	a	Cedar x 6	To 5m	NA	LOW	Collection of trees extending over 50m with dense ivy cover , however trees in good condition with no visible features of decay, where trunk/limbs are exposed.	LOW
B52	Dn	266	539	NR	67	a	Ash	2.5	W	MOD	Large split extends Dn branch towards main stem. Upwards facing so exposed to rain	MOD
B53	Up	266	640	3rd	68	a	Ash	3	W	HIGH	Hazard beam in limb	HIGH
B53	Up	266	640	3rd	68	b	Ash	3	S	HIGH	Possible cavity at knothole with collar, plus some ivy present. Not possible to see into cavity from ground.	
B54	Dn	266	690	3rd	69	a	Oak	3	N	HIGH	Possible cavity in dead limb where meets main stem, where there s a sight gap at the collar	HIGH
B54	Dn	266	690	3rd	70	a	Oak- mature	To 3m	NA	LOW	Mature oak with some ivy cover and a dead limb (no cavities observed). No features visible, but due to characteristics of tree, has been assessed as having low potential.	LOW
B55	Dn	266	719	3rd	71	a	Oak- mature	To 4m	NA	LOW	Some ivy cover present however condition of tree fairly good. Limb tearouts present, but no PBR features visible. Given characteristic of tree has been assessed as having low potential.	LOW
B56	Up	266	843	NR	72	a	Ash	2	S	MOD	Limb tearout with small cavity around collar. Could be endoscoped from ground with an extension	MOD
B57	Dn	266	983	NR	73	a	Oak	4	NE	HIGH	Two small holes in thin branch. Potential to cavity to extend into limb	HIGH
B58	Dn	266	1050	NR	74	a	Oak	2.5	NW	MOD	Small hole in branch knothole at trunk, potential for cavity to extend in trunk	MOD
B59	Up	266	1072	NR	75	a	Oak	1	W	HIGH	Hazard beam in low limb, however open to rain	HIGH
B59	Up	266	1072	NR	75	b	Oak	To 5m	NA	LOW	Ivy cover on tree.	
B60	Dn	266	1220	NR	76	a	Oak and ash	-	NA	LOW	Collection of mature trees comprising oak and ash with ivy cover present, however general condition of trees good with no visible features of decay, where trunk/limbs are exposed.	LOW
B60	Dn	266	1230	NR	77	a	Oak	2.5	N	MOD	Tearout cavity extending into limb	MOD

B61	Up	267	814	NR	78	a	Mixed	-	NA	LOW	Several trees with ivy cover however general condition of trees good with no visible features of decay, where trunk/limbs are exposed.	LOW
B62	Dn	267	1384	NR	79	a	Willow	2	W	LOW	Where branch has broken/torn from flailing, potential cavity extending into limb. However low Dn on tree and open to rain, so considered unsuitable	
B63	Dn	267	1414	NR	80	a	Ash	To 4	NA	LOW	Ivy cover however general condition of tree good with no visible features of decay, where trunk/limbs are exposed.	LOW
B64	Up	267	1433	NR	81	a	Ash	2.5	W	MOD	Small knothole on trunk which may extend into trunk	MOD
B64	Up	267	1433	NR	81	b		4	W	MOD	Old tearout, not possible to determine whether extends into cavity from ground.	
B65	Dn	267	1648	NR	82	a	Oak	3	N	MOD	Broken limb/tear, potentially extending into the limb in cavity. However open to rain reducing suitability	MOD
B66	Dn	267	1667	NR	83	a	Oak	2.5	N	LOW	Small cleft in tree, doesn't appear to extend into trunk cavity	LOW
B67	Dn	267	1720	NR	84	a	Oak	To 4	NA	LOW	Ivy cover however general condition of tree good with no visible features of decay, where trunk/limbs are exposed.	LOW
B68	Up	268	2	NR	85	a	Willow	2	W	MOD	Vertical split/ cavity in limb	MOD
B69	Dn	268	239	NR	86	a	Ash	1.5	E	LOW	Tree with torn limbs, which may provide cavity, but from ground doesn't appear to extend into limb. Old tearout with collar, doesn't extend anywhere.	LOW
B70	Up	268	1206	3rd	87	a	Ash	1.5	E	MOD	Tearout with potential to lead into cavity on trunk. Can be endoscoped from the ground.	MOD
B71	Up	268	1268	3rd	88	a	Ash	3.5	E	MOD	Limb broken, plus a knothole which may offer some potential.	MOD
B71	Up	268	1268	3rd	88	b	-	3	SW	MOD	Dead limb facing SW. Unable to see limb due to location to assess fully. However rotted wood visible, so potential for cavity. Located in 3rd party, recommend if to be removed, further inspection needed.	
B72	Up	268	1643	3RD	89	a	Ash	To 4	NA	LOW	Sparse ivy cover on tree. Condition of tree reasonable but size and characteristics of LOW potential tree.	LOW
B73	Dn	269	1681	3rd	90	a	Ash	To 3	-	LOW	Ivy cover on trunk. Condition of tree reasonable. Small knothole at 4 m however at tear but doesn't extend anywhere.	LOW
B74	Dn	269	17	NR	91	a	Ash	To 3m	NA	LOW	Thin ivy cover. Condition of tree reasonable, except where previous cut limbs have rotten, however these are open to the rain, reducing suitability.	LOW
B75	Up	269	64	NR	92	a	Ash	4.5	E	MOD	Where branch has previously been cut there is a split with vertical crevice.	MOD
B76	Up	269	194	3rd	93	a	Ash (x2)	NA	NA	LOW	Two ash trees. Ivy cover on stem. Condition of tree reasonable but size and characteristics of LOW potential tree.	LOW
B77	Dn	269	227	NR	94	a	Ash	2.5	NW	LOW	Cleft in limb, but doesn't extend anywhere. Thin ivy cover. Size and characteristics of LOW potential tree.	LOW
B78	Up	269	460	NR	95	a	Oak	3	NE	MOD	Split where limb has torn which may offer a crevice suitable for bat roosting	MOD
B78	Up	269	460	NR	95	b	-	2.5	NE	LOW	Torn limb which may offer crevice. Some ivy cover and torn limbs however, these do not appear to offer suitable crevices for bats.	
B79	Dn	269	602	NR	96	a	Oak	To 3m	NA	LOW	Dense ivy cover which may conceal further features. Size and characteristics of LOW potential tree.	LOW
B79	Dn	269	606	NR	97	a	Oak	4	SW	MOD	Small cleft in limb which may extend into a thin limb	MOD
B79	Dn	269	606	NR	97	b	-	NA	NA	LOW	Mod ivy cover on stem. Condition of tree mod. No other PBRF visible.	
B79	Dn	269	610	NR	98	a	Ash	3	N	MOD	Knothole with hole (5cm) extending Dn into trunk (open to rain), which may extend into larger cavity in trunk which is approx 30cm wide. Ivy present on the rest of the tree.	MOD
B80	Dn	269	627	NR	99	a	Oak	NA	NA	LOW	Mature oak. Superficial limb tears but do not extend far enough to provide suitable crevice for bats. Some ivy cover. Size and characteristics of a tree with LOW potential.	LOW
B81	Up	269	788	NR	100	a	Oak	NA	NA	LOW	Dense ivy cover on tree which may conceal further features. However general condition of tree is good with no other PBRF visible.	LOW
B82	Dn	269	803	3rd	101	a	Ash	3	NW	HIGH	Large tear out in trunk with exposed heartwood and possible cavity.	HIGH
B82	Dn	269	803	3rd	101	b		1.5	SE	LOW	Canker and knothole, however it doesn't appear to extend into a cavity and as such offers low potential at best.	
B82	Dn	269	809	3rd	102	a	Pine	1.5 & 3	SW	MOD	Rotten limbs with potential for cavities to be present but fairly limited potential. Knothole present but doesn't extend to cavity, hence negligible potential	MOD
B82	Dn	269	814	3rd	103	a	Pine	3	W	MOD	Small knothole which may extend into trunk	MOD
B82	Dn	269	814	3rd	104	a	Ash	NA	NA	LOW	Ivy cover on tree however condition reasonable. No other PBRF visible.	LOW

B82	Dn	269	815	3rd	105	a	Pine	E	W	Cannot assess	Can't fully assess due to holly cover in front of tree. Appears as if a cleft may be present in E facing limb however view obscured. Would need further investigation.	Cannot assess
B83	Dn	269	835	3rd	106	a	Ash	2.5	W	MOD	Small knothole, which may extend into thin limb	HIGH
B83	Dn	269	835	3rd	106	b	-	2.5	SW	LOW	Small knothole	
B83	Dn	269	835	3rd	106	c	-	3	W	HIGH	Dense ivy cover. Partially obscuring a potential cavity in the trunk at tearout. Can't assess fully but appears to be large cavity which may extend into trunk	
B84	Up	270	216	NR	107	a	Ash	NA	NA	LOW	Ivy cover, but general condition of tree is good. A torn limb is present but it doesn't lead to a crevice.	LOW
B85	Dn	270	774	NR	108	a	Oak	1.5	NW	MOD	Potential cavity at a knothole which may extend into trunk.	MOD
B85	Dn	270	774	NR	108	b	-	1.5	W	MOD	Tearout, possibly extending into a cavity, however unable to view fully to assess. Mod as a precaution.	
B85	Dn	270	774	NR	108	c	-	2.5	W	LOW	Tearout but doesn't appear to extend into a crevice suitable for bats.	
B86	Dn	270	786	3rd	109	a	Ash?	1.5	S	MOD	Knothole on limb, which may extend into cavity	MOD
B86	Dn	270	786	3rd	109	b	-	3	E	MOD	Rotted vertical limb, large cavity in rotted wood.	
B86	Up	270	790	NR	110	a	Oak	NA	NA	LOW	Ivy cover on tree, but general condition of tree good and no further PBRF visible.	LOW
B86	Dn	270	800	NR	111	a	Ash	NA	NA	LOW	Ivy cover on tree, but general condition of tree good and no further PBRF visible.	LOW
B86	Dn	270	822	NR	112	a	Ash	2	W	MOD	Possible cavity at bend in limb	MOD
B86	Dn	270	822	NR	113	a	Ash	1.5	NW	MOD	Small knothole which may extend into trunk	MOD
B86	Dn	270	822	NR	113	b		2	S	MOD	Large cavity at tearout which likely extends into trunk	
B86	Dn	270	822	NR	113	c		2.25	NW	LOW	Small knothole in trunk, however stem thin approx 20cm	
B86	Dn	270	822	NR	113	d		2.75	NW	LOW	Small knothole in trunk.	
B87	Dn	270	831	NR	114	a	Ash and oak	NA	NA	MOD	Collection of trees with ivy cover. Trees in reasonable condition but age and characteristics of trees with LOW potential. Recommend ivy strip and soft fell.	MOD
B88	Dn	270	889	NR	115	a	Ash	2.5	W	MOD	Small knothole, may extend into limb but limb very thin (approx 15cm) hence roosting potential limited.	MOD
B89	Dn	270	988	NR	116	a	Western red cedar	2.5	-	LOW	Where twists in limbs several crevices present, but don't appear to extend into trunk and condition of tree otherwise good.	LOW
B90	Dn	270	1050	NR	117	a	Yew	-	-	Cannot assess	Cover very dense so difficult to access. Some twisting of limbs, needs to be climbed to assess further	Cannot assess
B91	Dn	270	1050	NR	118	a	Conifer sp.	-	-	Cannot assess	Cover very dense so difficult to access. Needs to be climbed to assess further	Cannot assess
B92	Up	270	1416	3rd	119	a	Ash	2	NE	MOD	Split extending along trunk, may extend into cavity. Top of tree is rotten	MOD
B93	Dn	270	1475	NR	120	a	Ash and Oak	-	NA	LOW	Collection of trees with ivy cover, however general condition of tree good with no visible features of decay, where trunk/limbs are exposed. Recommend ivy strip.	LOW
B94	Up	271	66	NR	121	a	Sycamore	-	NA	LOW	Ivy cover on tree, however general condition of tree good with few dead limbs but no features visible where exposed.	LOW
B95	Up	271	98	NR	122	a	Leyland cypress	3	E	MOD	Cleft in trunk, which may offer potential roosting habitat	MOD
B96	Dn	271	194	NR	123	a	Several ash trees	-	NA	LOW	Collection of ash trees with ivy cover on trunk. However general condition of trees good with no visible features of decay or bat roost features, where trunk/limbs are exposed.	LOW
B97	Up	271	277	3rd	124	a	Mature oak	4	S	HIGH	Hazard beam in branch	HIGH
B97	Up	271	277	3rd	124	b	Mature oak	3.5	S	MOD	Branch break, with potential for cavity to extend into branch	
B97	Up	271	277	3rd	124	c	Mature oak	3.75	E	MOD/ HIGH	Knot hole present and split in limb. Large mature oak, however condition is generally good apart from a few limb features, no obvious features in main stem	
B98	Up	271	358	NR	125	a	Oak	1.5	E	MOD	Possible cavity in trunk, ivy cover in front which is obscuring view. Moderate assessment to be precautionary	MOD
B99	Dn	271	471	3rd	126	a	Ash	2.5	N	MOD	Possible cavity in trunk. Tree in 3rd party land but with an overhanging limb (which has no features)	MOD

B99	Dn	271	471	3rd	126	b	Ash	3.5	S	MOD	Split , which may extend into limb, however open to rain	
B100	Up	271	519	3rd	127	a	Ash	-	NA	LOW	Ivy cover on tree, however general condition of tree good with but no potential features visible where exposed, but size and characteristics of the tree has given a precautionary assessment of Low,	LOW
B101	Up	271	1216	3rd	128	a	Willow	2.5	E	MOD	Small cavity in tree which may extend back into heartwood	MOD
B102	Dn	271	1280	NR	129	a	Oak	2	W	LOW	Broken limb open at the end, however limb thin so unlikely to provide much opportunity for roosting	LOW
B102	Dn	271	1280	NR	130	a	Oak	1	W	LOW	Bark pulling away from trunk with potential gap beneath. Plus dense ivy cover on tree	LOW
B103	Dn	271	1299	NR	131	a	Oak	2	SW	MOD	Split in limb with potential to extend into limb. Plus dense ivy cover on tree.	MOD
B104	Dn	271	1369	NR	132	a	Willow	1.5	N	MOD	Crevice in trunk, which may provide limited space for bat	MOD
B104	Dn	271	1369	NR	132	b		2	NE	LOW	Recent break in limb with exposed heartwood. Unable to see whether it extends into cavity. Open upwards so exposed to rain, which reduces suitability	
B105	Dn	271	1489	NR	133	a	Willow	2	N	LOW	Tear / broken limb with exposed heartwood, however low Dn ad open to the rain, so considered unsuitable for bats,	LOW
B106	Dn	271	1676	NR	134	a	Oak	1.5	N	MOD	Split and callous in thin limb, potential for cavity to extend into limb	MOD
B107	Dn	271	1710	NR	135	a	Willow	2	SW	LOW	Split in limb, upward facing so open to rain, decreasing suitability.	LOW
B108	Dn	272	185	NR	136	a	Oak	2.5	S	MOD	Horizontal cavity and collar in limb, not possible to see into cavity, however branch is thin	MOD
B109	Dn	272	300	NR	137	a	Ash	2.5	E	MOD	Knothole. Top of limb is open to the rain and rotted so may be wet inside.	MOD
B110	Dn	272	410	NR	138	a	Oak	To 5m	NA	LOW	Ivy cover on mature oak however general condition of tree good with no visible features of decay, where trunk/limbs are exposed.	LOW
B111	Dn	272	587	NR	139	a	Oak	To 3.5	NA	MOD	Dead oak with dense ivy cover. Some dead limbs but no features visible, but can't rule out potential for cavities at tear	MOD
B112	Dn	272	728	NR	140	a	Ash	3.5	SW	MOD	Old flush cut, that has rotted over time. May lead to cavity however is open to rain	MOD
B113	Dn	272	1450	3rd	141	a	Oak	4	NW	MOD	Limb with small cavity which appears to extend into cavity	MOD
B113	Dn	272	1450	3rd	141	b	Oak	4	NW	MOD	Where thin dead limb extends into branch possible gap for bat to enter	
B113	Dn	272	1450	3rd	141	c	Oak	4	SW	LOW	Dead limb with potential gap at collar into trunk	
B114	Dn	272	1480	3rd	142	a	Dead tree - no ID	2.5	E	MOD	woodpecker holes in dead trunk (one of three), may extend into internal rotten cavity but diameter fairly narrow	MOD
B114	Dn	272	1480	3rd	142	b	Dead tree - no ID	2.75	E	HIGH	woodpecker holes in dead trunk (one of three), may extend into internal rotten cavity but diameter fairly narrow	
B114	Dn	272	1480	3rd	142	c	Dead tree - no ID	3.5	E	HIGH	woodpecker holes in dead trunk (one of three), may extend into internal rotten cavity but diameter fairly narrow	
B115	Dn	272	1503	NR	143	a	Oak	1.5	W	MOD	Knothole with cavity which may extend into trunk	MOD
B115	Dn	272	1503	NR	143	b	Oak	2	W	MOD	Knothole with cavity which may extend into trunk	
B116	Dn	272	1507	NR	144	a	Oak	1.25	SW	HIGH	Large knothole approx 10cm across which may extend into internal cavity. Tree dead at the crown but narrow.	HIGH
B116	Dn	272	1507	NR	144	a	Oak	0.75	NW	HIGH	Knothole which may extend into cavity	
B116	Dn	272	1507	NR	144	b	Oak	2	NW	MOD	Vertical split/ cavity which may extend into trunk	
B117	Dn	272	1514	3rd	145	a	Oak- dead	2	W	MOD	Dead limb with split and branch collar, with potential for cavity. Could be endoscoped from ground	MOD
B118	Dn	272	1588	3rd	146	a	Oak	1.5	W	MOD	Knothole which may extend into cavity trunk	MOD
B119	Dn	272	1655	3rd	147	a	Sycamore	2.25	W	MOD	Knothole that may extend into trunk	MOD
B119	Dn	272	1655	3rd	147	b	Sycamore	2	W	MOD	Knothole with branch collar	
B120	Up	273	71	3rd	148	a	Willow	3	NE	HIGH	Mature willow tree, approximately 20m from rail and will not be impacted by works however has high potential for bats and potential for disturbance. Large limb cavity at tearout plus dense ivy cover which may hide other features. Tree dead and limb large enough to have substantial cavity	HIGH
B124	Up	273	460	3rd	152	a	Beech	5	N	MOD	Cavity in trunk next to large tearout (tearout does not extend into trunk)	MOD
B121	Up and Dn	273	512	NR	149	a	Several oaks	NA	NA	LOW	Collection of mature oaks on Up and Dn with ivy cover. However general condition of tree good with no visible features of decay, where trunk/limbs are exposed.	LOW
B122	Up	273	539	NR	150	a	Beech	4	N	MOD	Cavity which may extend into trunk. Also callous collar which may have potential feature, but not able to view clearly from the ground	MOD
B123	Dn	273	561	3rd	151	a	Ash	5	SW	MOD	Cavity in limb with slight branch collar	MOD

B123	Dn	273	561	3rd	151	b	Ash	5.5	SW	MOD	Cavity in limb with slight branch collar	
B125	Dn	273	671	3rd	153	a	Oak and ash	NA	NA	LOW	Two trees (oak and ash) with no obvious PBR features but size and characteristics, give low potential	LOW
B125	Dn	273	678	3rd	154	a	Oak	4	W	MOD	Vertical split in limb with potential for cavity	MOD
B125	Dn	273	678	3rd	154	b	Oak	4.5	W	MOD	Vertical split in limb with potential for cavity	
B126	Up	273	827	3rd	155	a	Ash	1	N	MOD	Vertical split in trunk	MOD
B127	Dn	273	840	3rd	156	a	Ash	3	S	MOD	Tear out in limb with exposed rotten wood at tear, potential for cavity to extend int limb. However, tear open to rain which may reduce suitability	MOD
B128	Dn	273	1572	NR	157	a	Oak?	2.5	SW	HIGH	Hazard beam present in branch. Branch thin but potential for cavities at each end of beam	HIGH
B129	Dn	273	1625	NR	158	a	Ash?	2.5	S	LOW	Very small cavity at collar, on thin limb leaning towards bridge	LOW
B130	Dn	273	1652	NR	159	a	Oak	2.5	NW	MOD	Tree with cavity at knothole and collar, which may extend into cavity	MOD
B130	Dn	273	1652	NR	159	b	Oak	2	W	MOD	Tree with cavity at knothole with collar, which may extend into cavity	
B130	Dn	273	1652	NR	159	c	Oak	2.25	W	MOD	Tree with cavity at knothole with collar, which may extend into cavity	
B131	Dn	274	685	NR	160	a	Ash	2	N	HIGH	Knothole cavity with collar extending into trunk	HIGH
B132	Dn	274	685	NR	160	b	Ash	6	SE	LOW	Dead limb with possible cavity at collar but thin	
B132	Dn	274	821	NR	161	a	Western red cedar	3.5	N	MOD	Twist in limb/ hazard beam, with light visible through gap. Potential for small cavity	MOD

Appendix 3 – Priority species of Invertebrates recorded within 2km of the Site.

Common name	Scientific name	Protected status	Common name	Scientific name	Protected status
Grey Dagger	*Acronicta psi*	S7	Pretty Chalk Carpet	*Melanthia procellata*	S7
Centre-barred Sallow	*Atethmia centrago*	S7	Grass Rivulet	*Perizoma albulata albulata*	S7
Mottled Rustic	*Caradrina morpheus*	S7	White-letter Hairstreak	*Satyrium w-album*	S7
Small Heath	*Coenonympha pamphilus*	S7	White Ermine	*Spilosoma lubricipeda*	S7
Small Square-spot	*Diarsia rubi*	S7	Buff Ermine	*Spilosoma lutea*	S7
Small Phoenix	*Ecliptopera silaceata*	S7	Blood-vein	*Timandra comae*	S7
September Thorn	*Ennomos erosaria*	S7	Cinnabar	*Tyria jacobaeae*	S7
Dusky Thorn	*Ennomos fuscantaria*	S7	Pied Grey	*Eudonia delunella*	-
Rustic	*Hoplodrina blanda*	S7	Coastal Pearl	*Mecyna asinalis*	-
Rosy Rustic	*Hydraecia micacea*	S7	Rhopalomesites tardyi	*Rhopalomesites tardyi*	-
Wall	*Lasiommata megera*	S7	Beet Moth	*Scrobipalpa ocellatella*	-
Shoulder-striped Wainscot	*Leucania comma*	S7	Pretty Chalk Carpet	*Melanthia procellata*	S7
Brindled Beauty	*Lycia hirtaria*	S7	Grass Rivulet	*Perizoma albulata albulata*	S7
Lackey	*Malacosoma neustria*	S7	White-letter Hairstreak	*Satyrium w-album*	WCA5, S7
Dot Moth	*Melanchra persicariae*	S7	White Ermine	*Spilosoma lubricipeda*	S7

Appendix 4 – Ecological Best Practice Guidance for Vegetation Management Works

The following best practice measures should be implemented throughout the vegetation management works.

Works site best practice

- Deep excavations should be covered overnight, or when unsupervised during works.
- Shallow excavations should install a ramp (e.g. wooden plank) to allow animals to escape.
- All chemicals to be stored securely, and in accordance with their product labelling.

Working in proximity to water courses

- Pollution prevention measures must be adhered to when working in proximity to watercourses.
- No herbicides are to be used within 5 m of a watercourse. Only pesticides approved for use in or near water may be used when working in proximity to water courses.
- Herbicide treatment limited to treating stumps and using glyphosate by suitably qualified staff. The operators must comply with all requirements of the herbicide product label.
- Ensure that material arisings from vegetation clearance (i.e. chippings / brash) and chemicals are not discharged into waterbodies.
- Biodegradable fuels should be used with hand-held machinery.
- Construction plant 'nappy' / spill containment pads should to be used to hold hand-held machinery when idle, and drip trays used when refuelling. Spill kits should be provided, to allow any chemical or fuel spillages to be remediated quickly.

Two-stage vegetation clearance methodology for 'to ground' clearance

- Vegetation should be cut to 30 cm utilising hand tools only.
- The area should be left for 24 hours to allow animals (such as amphibians and reptiles) to leave the area.
- After 24 hours a visual inspection of the area should be undertaken to check for any animals present, especially under refugia such as brash, decaying wood and rubble etc.
- If any animals are found, works should stop and the Ecologist contacted for further advice.
- If no animals are found the remainder of the vegetation can be removed to ground.

Non-native invasive plant species

- An exclusion zone (minimum 7 m) should be demarked and enforced around non-native invasive plant species. Avoid working and walking within these areas where possible.
- Where this is not possible best practice biosecurity measures should be followed, and treatment of INNS should be considered.
- All clothing, footwear and machinery to be cleaned of vegetation debris following contamination. Cleaning must be undertaken at the extent of the area of contamination to prevent spreading INNS across the entire works site.

Best practice for removal of trees, that haven't been assigned BRP

Trees should be removed following best practice methodology, as follows:

- Dense ivy should be stripped by hand where possible, to allow inspection for roost features beneath.
- If there is concern that bats may be present within features not previously identified, work to the tree must stop and the 'on call' ecologist contacted for advice.
- Contractors should avoid cutting through cavities in the trunk and limbs, instead position cut suitably far above or below the cavities.
- Large plates of flaking bark should be removed by hand where possible, to allow for inspection for any bats present behind.
- Trees with features should be "sectionally felled" where the limbs and trunk are lowered to the ground and left in place for at least 24 hours, with the cavity facing outwards, so any bats present have opportunity to leave.

Appendix 5- Ecological Constraints and Opportunities Plan