

# Narberth – Canaston Bridge

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## Preliminary Ecological Appraisal

August 2018



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VAT Registration No. 416740656

Document number:	
Revision number:	
Purpose of issue:	First draft
Date issued:	September 2018
Author:	Jim Whiteford
Checked:	

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## Executive Summary

Sustrans have undertaken a series of surveys to inform the creation of a new traffic-free path between Narberth and Canaston Bridge in Pembrokeshire, Wales. The route measures approximately 7.1km in length and is located along a mixture of adopted highways, stone and earth access tracks and footpaths. This appraisal and the studies which underpin it focus on two discrete off-road sections of the wider route (Section A and Section B).

In order to provide an initial assessment of the likely ecological constraints of this proposal, a Preliminary Ecological Appraisal (PEA) has been conducted. The field work which underpins this PEA comprises of two separate visits completed on 17-18 April and 13 June 2018. The PEA provides a summary of the assessments completed to date and as such an assessment of nature conservation sites, habitats and protected and notable species identified along the route and details mitigation, where required to address the potential ecological impacts identified.

Following the initial site visit, further survey in respect of great crested newts, otter and hazel dormouse has been undertaken. Some informal consultation with local ecological stakeholders has also been completed.

The scheme would have direct impacts on East Cleddau SSSI (Unit 1017) and Cleddau Rivers SAC. The impacts in respect of these two designations would be small and of short duration and principally relate to improvements to the existing bridge and path which passes through this designation. Works within areas covered by this designation, including Narberth Brook will require mitigation and consent from Natural Resources Wales (NRW). No other statutory or non-statutory nature conservation sites would be impacted by works associated with the two route sections.

Path improvement works are proposed within woodland listed on the Ancient Woodland Inventory, principally within Plas Wood (Restored Ancient Woodland) and Canaston Wood (PAWS/ASNW). Works within Plas Wood are relatively small scale and would focus on improvements to drainage and resurfacing, verge habitats along the existing path edge would be lost as part of the scheme including those supporting ancient woodland indicator species. A new section of path near the northern entrance to Canaston Wood would lead to the removal of grassland and immature plantation woodland, although the habitats in this area have already been significantly altered as a result of gas pipeline works and the maintenance of an associated way leave. Mitigation and compensation measures, agreed in-consultation with NRW will be required to allow works to take place within Plas Wood and Canaston Wood.

Overall the scheme will result in direct loss of semi-natural habitat. The overall area of habitat loss is not considered to be high (c.0.8ha) as several sections of the route are physically constrained (preventing opportunities to widen the route) and works principally relate to resurfacing partially surfaced or compacted ground. However, given the high nature conservation value of the wider corridor, the works could result in a reduction in structural and species diversity. As such a series of indicative mitigation and enhancement measures have been set-out within Section 7.0.

Further studies have confirmed that great crested newts are unlikely to be impacted by the proposals. Otters are active, but do not currently appear to be breeding in close proximity to the section of Narberth Brook to be disturbed as part of the scheme. Badgers have been recorded foraging and crossing the path, with the closest breeding site (or sett) attributable to these species 100m south of Section A. The scheme is considered unlikely to significantly impact upon badgers, but further survey is recommended.

Potential impacts during construction have been identified for hazel dormouse and reptiles. It is anticipated that these construction impacts can be readily avoided through the application of reasonable avoidance measures and ecological supervision; with actions summarised in a series of Methods Statements to be prepared following the grant of planning consent.

Current planning policy requires that development projects not only minimise their ecological impacts but include enhancements wherever possible in proportion to their scale. The Local Authority and NRW should be consulted to determine appropriate measures. Recommendations included with this report include the development of a woodland management plan for Plas Wood, as well as the construction or implementation of a series of micro-features to benefit bats, birds, invertebrates and dormouse.

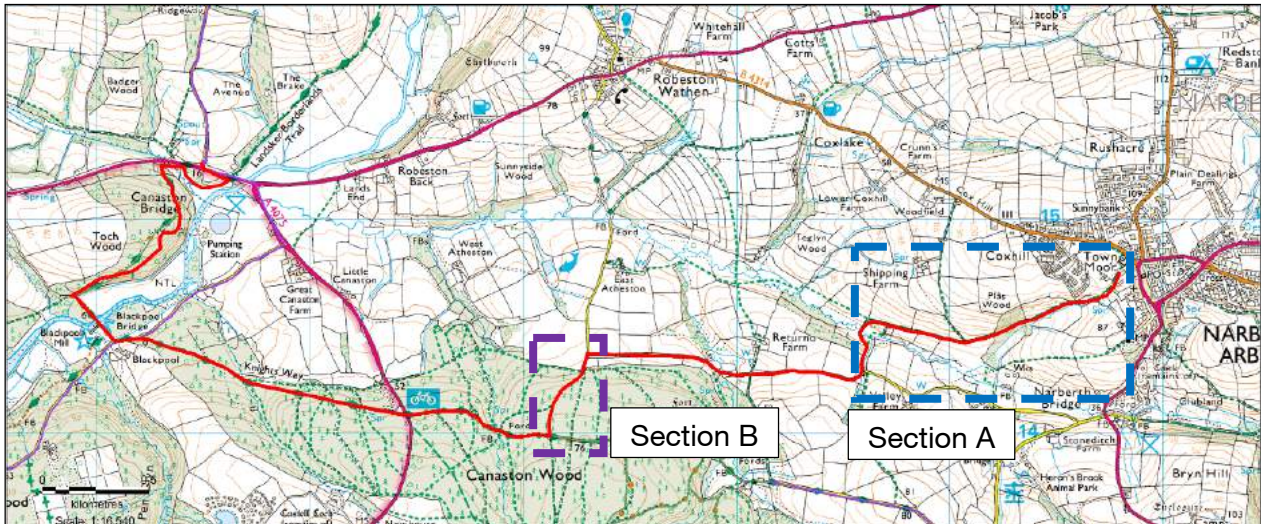


# 1 Background

## 1.1 Project Introduction

Sustrans has been commissioned to undertake a feasibility study for creating and improving an existing cycle route for walking and cycling which connects Canaston Bridge to the west with the town of Narberth to the east.

The proposed route is approximately **7.1km** in length and situated between Canaston Bridge and Narberth (SN 06593 15171 and SN 10795 14689). The main route primarily follows a mixture of public highways, existing un-bound stone and earth tracks. The route is shown on Drawing 1.1.



**Drawing 1.1: Proposed Route of Path**

The PEA which follows focuses on two discrete sections which would either lead to the widening, or enhancement of existing path. The remainder of the route would either be on-road or repurposing existing forestry tracks through re-surfacing of existing hard standing with no additional land take anticipated.

- **Section A – Narberth to Valley Road**

This section of the route starts at the existing public car park located on the south-western outskirts of Narberth and then follows an unbound aggregate footpath (Cadling Mill Lane) to the west before turning south across a tributary of the Eastern Cleddau River, through a small area of woodland and then a long an access track and road before meeting a ‘T’ junction with Valley Road. The route begins at NGR: SN 10761 14726 and ends at NGR: SN 09578 14270.

- **Section B – Valley Road to junction with Knights Way, Canaston Wood**

Beginning adjacent to an existing footpath entrance gate, this part of the proposed route travels south along a narrow path before reaching the entrance to Canaston Wood and turning south-west up an existing slope. The route then follows an existing forestry access track along the boundary of a mixture of ancient and plantation woodland before terminating at an existing junction with the main east-west forestry/access track through the wood. The route begins at NGR: SN 08299 14372 and ends at NGRSN 08117 13993.

## 1.2 Ecological Assessment

In order to provide an initial assessment of the likely ecological constraints of this proposal, a Preliminary Ecological Appraisal has been conducted. This assesses the possible impacts of the proposed works on nature conservation sites, habitats and protected or notable fauna. Due to the lighting proposals, an additional assessment of habitats likely to be important for bats has been undertaken.

A desk study has been undertaken to determine likely ecological impacts of the proposal, identify any further ecological assessments required and provide an evaluation of whether any ecological features identified might form a barrier or significant constraint to the proposal.

The desk study comprised a data search, an assessment of the likelihood of ecological features being present and an assessment of potential impacts.

A data search was undertaken to determine the presence of any designated nature conservation sites and protected or notable species recorded near the route. Natural Resources Wales (*MAGIC* website) and SEWBRc were contacted to obtain data relating to the route. The following information was determined;

- Designated sites of international importance within a 5km radius of the route;
- Other statutory designated sites within a 1km radius of the route;
- Non-statutory designated sites within a 1km radius of the route;
- Records of protected and notable species within 1km of the route\*; and,
- Priority habitats within 1km of the proposed route

\*These are species which have European and/or UK Legal Protection, Section 6 species (Environment (Wales) Act, UK BAP Priority Species, Global Red List, British Red Data Book, Nationally Rare & Scarce, RSPB Red and Amber Birds, Welsh Vascular Plant Red Data List, Local Biodiversity Action Plan (LBAP) Species, and Locally Important Species as identified by local experts.

### 1.2.1 Habitat Survey

An initial habitat survey of the proposed route was undertaken on 17 and 18<sup>th</sup> April 2018 by James Whiteford MCIEEM MRSB (Sustrans Ecologist). A slow walkover survey was conducted and habitats were recorded in and adjacent to the proposed works area using the standard Phase 1 Habitat Survey technique. This is a nationally recognised means for classifying habitats and was undertaken in accordance with the methodology issued by the Joint Nature Conservation Committee (JNCC, 2010). In addition to this basic survey, supplementary information was collected such as the presence of invasive species and descriptions of habitat condition, management and other observations that would affect value of habitats. During the survey the presence of fauna or their field signs were noted and habitats assessed for their potential to support protected or notable species. The extent of habitats has been mapped in 3.1.1 and 3.1.2 with features of interest shown as Target Notes.

A further survey of the proposed route, with a particular focus on an evaluation of the potential for otters and dormouse was conducted by James Whiteford on 13 and 14 June 2018. This habitat included a dedicated search for evidence of both of these species (see Section 1.2.5 and 1.2.6 below).

### 1.2.2 Badgers

A full survey of the route as well as 30m buffer either side was not completed as part of the field work in support of this PEA. However, any incidental signs of badger were mapped and recorded.



This included any badger setts, worn pathways in vegetation and/or across field boundaries, footprints, hairs, dung pits/latrines, bedding and evidence of foraging activity including snuffle holes.

Evidence was recorded in accordance with a standard approach as in 'The history, distribution, status and habitat requirements of the Badger in Britain, (1990)'.

Particular attention was paid to habitats of suitable topography or supporting suitable vegetation for sett-building as well as to those features particularly favoured by badgers including hedgerows, areas of dense scrub, woodland, ditches and banks.

All holes of an identified sett were examined closely and the number of active and inactive entrances and evidence of its usage were recorded. Where possible, setts identified during the survey were categorised using nationally recognised sett classification as described below:

- Main sett: These are large setts comprising a number of well-used, active holes with conspicuous spoil heaps. They are well established with worn paths to and from the sett and between entrances. Main setts are breeding setts and are normally in continuous use throughout the year, with only one main sett per social group of badgers;
- Annexe sett: Where present they occur in close association with the main sett (normally less than 150m away) and are linked to them by clear, well-worn paths. Annexe setts arise for the purposes of rear cubs should a second litter be born, and have several entrances (though not all in use at the same time);
- Subsidiary sett: These setts usually consist of three to five entrances which are not in continuous use. They are usually more than 50m away and may not have well-used paths connecting them to other setts; and
- Outlier sett: These typically comprise one to three holes with small spoil heaps indicating that they are not very extensive underground. They are used sporadically and are thought to serve multiple functions, including allowing efficient and safe travel to important parts of their home range.

### **1.2.3 Tree Assessment – Bats**

As part of the field survey conducted 17-18 April, 2018 an assessment of trees for roosting bats within 10m of the proposed route was completed. Trees were assessed in accordance with the criteria presented within the Bat Conservation Trusts Best Practice Guidance (2016). The field survey was completed by James Whiteford MCIEEM MRSB.

Trees of low, moderate or high bat roosting potential and the features they supported were inspected from the ground using high powered binoculars (8x Magnification) and a hand torch (Clulite 1 million candlepower). Any directly accessible features (i.e. below 2m height) were also checked using a hand torch. The location of individual trees and their bat roosting potential was recorded and mapped as part of the assessment.

### **1.2.4 HSI, eDNA and Box Trap Survey – Great Crested Newts**

A single pond within Section A (NGR: SN 09633 14486) was identified by the initial field survey as having suitability for great crested newts. Following this initial assessment, three further surveys were carried out on this feature to determine the presence/likely absence of great crested newts from 17-18<sup>th</sup> April, 2018. These surveys included a Habitat Suitability Index (HSI) appraisal, eDNA survey and aquatic box trapping exercise.

The HSI appraisal was completed as per Oldham et al (2000) and included the assessment of the pond against 10 separate criteria.

The eDNA survey was completed as per Natural England's' and National Resource Wales' Technical Note. The collection was completed by a NRW Great Crested Newt Licence Holder. The analysis of the eDNA samples was completed by Nature Metrics (<https://www.naturemetrics.co.uk/>).

A single Dewsbury trap was deployed overnight in the pond from the 17-18 April. The Dewsbury trap was deployed as per the agreed protocol (Dewsbury, 2011) by an NRW Great Crested Newt Licence Holder (James Whiteford).

### **1.2.5 Otter survey**

As evidence of otter activity had been identified as part of the initial field survey in April 2018, further assessment of these species and in particular Narberth Brook within Section A was conducted. The survey was completed by James Whiteford MCIEEM during daylight hours on the 13 June, 2018.

The otter survey comprised of a walk over assessment of the water feature banks up to 5m from the water's edge or 3m from the bank top, whichever was the greater. The surveyor walked the area looking for individuals and field signs; field signs include holts, slides, nest, tracks, prints and feeding signs.

Field signs are principally found through careful observation and movement of surface vegetation only. Each sign was logged by type, location, condition and age for later interpretation to distinguish differences in habitat use and activity. Where required and safe to do so, parts of the banks were inspected from inside the channel. When unsafe to enter the water feature the surveyor surveyed the bank tops. The survey extended for approximately 250m upstream and 75m upstream from where the route is proposed to cross the tributary.

### **1.2.6 Dormouse – Habitat Appraisal and Nut Search**

The initial field survey identified suitable arboreal and hedgerow habitats for hazel dormice. To gather further information as to the potential presence of dormouse and to assist in the evaluation of the potential impacts of the scheme, a habitat appraisal supported by nut search in suitable dormouse habitats was conducted. Habitats included as part of the assessment focused on those which may be significantly impacted (e.g. severance of hedgerows, cutting back of tree and scrub along existing paths).

This assessment was completed by James Whiteford MCIEEM as part of the follow-up surveys on the 13 and 13 June, 2018.

The assessment was based on the criteria set-out within the Dormouse Conservation Handbook (2006). A nut search along the hedgerows was not completed, as too few hazel nuts could be recovered. Hazel nuts collected were subject to close examination by the surveyor following completion of the assessment using a hand lens when required.

### **1.2.7 Assessment Aims**

This report includes an assessment of the potential impacts on ecological features from the proposed works. Where impacts are anticipated, the value of the ecological feature and scale of the impact have been assessed. This has been undertaken in accordance with CIEEM Guidelines for Ecological Impact Assessment (CIEEM 2016). This is considered in light of current ecological legislation and planning policy and so considers impacts on designated nature conservation sites, protected and notable species and landscape scale impacts such as habitat fragmentation.

This report makes recommendations regarding what implications ecology has on the feasibility of the proposed route creation, what further studies would be required and what measures to avoid, mitigate or compensate for ecological impacts are likely to be necessary.

### **1.2.8 Constraints**

Site visits, conducted at any time of year will miss a proportion of the species present. The initial visit was timed to coincide with the peak emergence period for woodland and hedgerow ground flora as this was the primary habitat of interest within Sections A and B and also to allow sufficient time for further great crested newt survey work to be undertaken this season, if required.

The second visit was timed to coincide with the peak emergence period for flowering plants associated with the open areas of grassland near the northern boundary of Canaston Wood. It should be noted that the purpose of the botanical assessment as part of this PEA was to classify the habitats and the dominant species within and therefore does not represent a full inventory of the higher and lower plant species present.

The HSI, eDNA and box trapping surveys were completed as per the agreed protocols. Full access around the pond was available and therefore no significant constraints applied to these surveys.

The ground based tree bat roost assessment was partially hampered by the uneven and often steep terrain which on occasion, prevented a full and complete inspection of trees of interest. Where views were hindered high powered binoculars were used from a range of vantage points. A precautionary principle in terms of categorising a trees bat roosting potential was applied in circumstances where it could not be fully assessed from the ground.

The badger assessment focused on the incidental recording of activity along the route, rather than a systematic search of a 30m buffer on either side. The survey was also completed when trees, hedgerows and scrub was partially in leaf which may have also resulted in signs of badger activity being overlooked. To compensate for this limitation, at least in part, where trails or other signs (e.g. setts) were noted they were either followed or approached (where access allowed) and inspected closely.

The dormouse habitat appraisal and accompanying hazel nut search are not sufficient to determine the likely absence of dormouse from within suitable habitats located along, or adjacent to the route. These two methods were applied as part of this study in response to the lack of dormouse records within 2km of the route, following discussions with the local planning ecologist and as this scale and proportion of likely vegetation is clearance as part of the scheme is considered to be low (e.g. no hedgerows, or large areas of tree or understorey would be removed as part of the project).

## 2 Baseline Information

### 2.1 Landscape

The route is situated within the Milford Haven National Landscape Character Areas (NLCA48). This is a very diverse landscape supporting deep water harbours and several key estuaries including those linked to the Eastern and Western Cleddau Rivers which run along the western edge of the route. The principal habitats inland comprise a mixture of agricultural fields bound by mature hedgerows and a number of large and extensive conifer plantations interspersed with important and valuable pockets of ancient woodland.

Section A of the route passes through a mixture of restored ancient woodland (Plas Wood) and pastoral farmland bound by mature, possibly ancient hedgerows prior to crossing a tributary of the East Cleddau River within a block of wet woodland. The route then follows an existing access road bound by mature, possibly ancient hedgerows on either side.

Section B is principally located within Canaston Wood, which supports blocks of ancient and plantation on ancient woodland soils. All the areas of woodland along the route have been identified by NRW as being worthy of improvement and enhancement to maintain and increase their value as important components of the local habitat network<sup>1</sup>.

### 2.2 Nature Conservation Sites

Four internationally designated sites have been identified within 5km of the proposed route;

- Cleddau Rivers
- Yerboston Tops
- Pembrokeshire Bat Sites and Bosherton Lakes
- Pembrokeshire Marine

These four sites are Special Areas of Conservation (SAC).

The western portion of the route (SN 07451 14088 – SN 06645 15156) is located within Pembrokeshire Coast National Park.

No locally designated sites, e.g. Sites of Importance for Nature Conservation (SINC), have been identified within 1km of the proposed route.

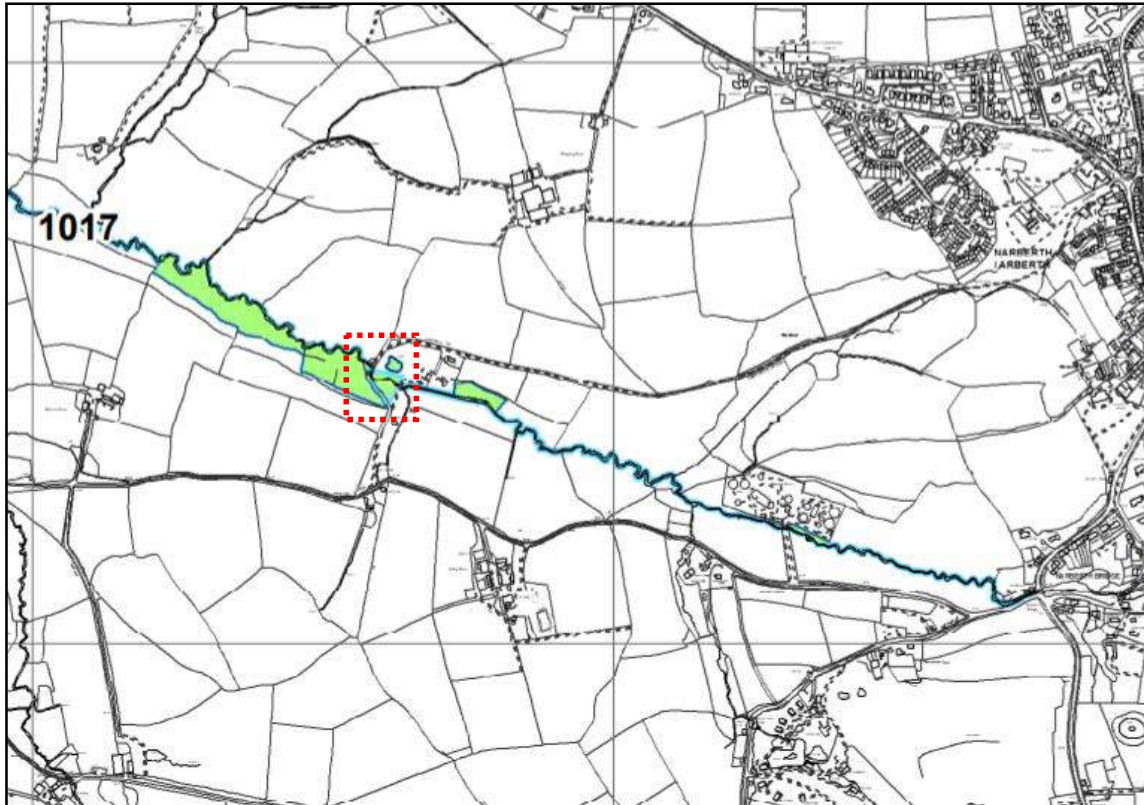
All of these sites including their reasons for designation are summarised below;

#### **Cleddau Rivers SAC**

The closest SSSI unit (Eastern Cleddau, Unit 1017) belonging to the SAC, comprises a tributary of East Cleddau River, a pond and broadleaved woodland located on either side of the bank to the south-west of Narberth at SN 09587 14489. See Figure 2.1.1 below.

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<sup>1</sup> <http://lle.gov.wales/catalogue/item/HabitatNetworks/?lang=en>



**Figure 2.1.1** – Map extract showing interface between proposed route and SSSI Unit 1017, East Cleddau / part of Cleddau Rivers SAC. Central NGR: SN095144. Map source: Natural Resources Wales

The primary reason for the award of the SAC designation is that the site supports a series of Annex II species, including brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, bullhead *Cottus gobio* and otter *Lutra lutra*. All of these species are considered to be common and widespread throughout the catchment, but have historically suffered significant and sustained declines in range and population size throughout Europe in the last fifty years.

Secondary reasons for designation include:

- Presence of a rare wetland plant community characterised by the abundance of water crowsfoot *Ranunculus fluitans* and *Callitriche* sp. (3260 Water courses of plain to montane levels with water crowsfoot and *Callitriche-Batrachion* vegetation, Grade C)
- Active raised bog, accounts for up to 17% of the total area covered by the designation and is identified as a priority feature in its own right (7110 Active raised bogs, Grade C). Raised bogs have suffered significant declines in cover due to agricultural practices.
- Important stands of wet, alder *Alnus glutinosa* and ash *Fraxinus excelsior* rich woodland are distributed along the banks of the rivers and tributaries which combined to make up the designation. (91E0 Alluvial forests, Grade C).

Examination of the accompanying management plan for the SAC (NRW, 2017) indicates that the primary qualifying features for SSSI unit 1017 are brook lamprey, otter and wet woodland. Major threats identified to this part of the SAC include invasive species (Himalayan balsam) and diffuse pollution from agricultural land management.



The accompanying SSSI citation for the site (354.2ha) makes the following additional observations:

- The river provides a breeding site for a number of declining and more common bird species. As well as a number of wildfowl and open ground species either in decline, or listed on Schedule 1 of the Wildlife and Countryside Act e.g. Kingfisher and barn owl
- Two nationally scarce lower plants are also found along the river; the liverwort *Porella pinnata* and moss *Schistidium platyphyllum*.
- Greater *Rhinolophus ferrumequinum* and lesser horseshoe bats *R. hipposideros*. (Annex II species) and common pipistrelle *Pipistrellus pipistrellus* also forage and commute along the river.

### **Yerbeston Tops**

This site is located approximately 4.5km south of the proposed route at its closest point. The site is relatively compact (18.6ha) and supports a full spectrum of grassland and upland moor habitats.

The primary reason for the selection of the site is an isolated breeding population of over 1500 marsh fritillary butterflies *Euphydryas asynaria* and is a key protected sites for these species in west Wales.

The presence of purple moor grass/Molinia meadows (Annex I) on a mixture of calcareous and acid substrates is a secondary qualifying feature for the site. The relevant SSSI citation for the SAC – (Yerbeston Tops – Knapps and Yerbeston Tops – Campshill – Gurness Moor / Units 153 and 154) also identified the following additional features:

- Several uncommon plant species including petty whin *Genista anglica*, wavy St John's wort *Hypericum undulatum* and world caraway *Carum verticillatum* are present. Nationally rare three-lobed crowfoot *Ranunculus tripartitus* grows in areas of wet ground on the site.
- A varied assemblage of invertebrates including uncommon moth and beetle species are also present.
- Reed bunting (RSPB Red List), willow tit (RSPB Red List) and grasshopper warbler (Amber List) have also been recorded

### **Pembrokeshire Bat Sites and Bosherton Lakes**

SSSI units making up the SAC are spread across Pembrokeshire, with the majority focused more than 10km to the north-west and south of the proposed route. The closest SSSI Unit (Unit 03a-c) is approximately 2.8km west and is located at Sleback Park along the banks of the River Cleedau.

The primary qualifying feature for the SAC is the presence of an unusual lake system at Bosherton Lakes approximately 22km south-west of the route. The water within the lake supports an internationally valuable assemblage of submerged and marginal aquatic plant species including a number of different stonewort species *Chara spp.* As whole the lake is classified as an Annex I Habitat – 3410 *Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.*

A second primary qualifying feature for the SAC, is that it support 9.5% of the UK's greater horseshoe bat population (Annex II Species). The closest SSSI unit to the route, Sleback Park is a key breeding site (one of only two in Wales) and hibernation site for these species. The wooded corridor along the banks of the river (which extend up to and include those associated with the route) are considered to provide optimal foraging grounds for greater horseshoe bats. The western edge of

the route near Blackpool Mill is located inside the core sustenance zone<sup>2</sup> for bats roosting at Sleback Park.

Secondary qualifying features for the SAC include the presence of lesser horseshoe bats and otter (both Annex II species).

### **Pembrokeshire Marine**

The Pembrokeshire Marine SAC is the third largest marine SAC in the UK, covering an area of 138,069 ha. The site extends from near Aberiddy in north Pembrokeshire all the way round to Manorbier in south Pembrokeshire. The SAC incorporates Milford Haven Waterway. The boundary of the SAC extends along the Cleddau River and terminates adjacent to Blackpool Mill.

Primary reasons for designation of the site include the presence of Annex I habitats:

- 1130 Estuaries – The SAC includes the Daugleddau estuary which is one of the best examples of a ria<sup>3</sup> in the UK. The estuary supports a wide diversity of different plant and animal communities including an exceptional assemblage of tide-swept sponges. The mudflat, particularly in the upper reaches are also rich in wildlife and include produce invertebrate communities.
- 1160 Large shallow inlets and bays – The sediment including sandy embayment of St Brides Bay provide optimal conditions for a range of internationally notable plant communities including extensive beds of narrow-leaved eelgrass *Zostera angusitolia*. The geomorphology of the inlets and bays also accommodate a wide range of subtidal and intertidal rocky habitats.
- 1170 Reefs – Extensive areas of sublittoral rock reef stretch offshore and through Milford Haven. The variety of coastal land forms, slope, aspect and topography and the high water quality within the SAC produce conditions for a wide diversity and abundance of biological communities. More sheltered reefs, inland support a number of important sponge and ascidian (sea squirt) communities.

A series of Annex II species are present in sufficient numbers to also qualify as a primary reason for qualification as a SAC these include:

- 1364 Grey seals *Halichoerus grypus* - Habitats within the SAC provide nationally important breeding grounds for grey seal, supporting 2% of the annual UK pup production.
- 1441 Shore dock *Rumex rupestris* – The upper shores and wet hollows of sand dunes along the coast support this critically endangered species

Other qualifying features which are of high ecological importance, but not represent a primary reason for designation include:

- A series of additional Annex I habitats:
  - 1110 Sandbanks which are slightly covered by sea water all the time
  - 1140 Mudflats and sandflats not covered by seawater at low tide
  - 1150 Coastal lagoons
  - 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae*
  - 8330 Submerged or partially submerged sea caves

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<sup>2</sup> BCT (2016) Section 3.7, Table 3.5

<sup>3</sup> A ria is a coastal inlet formed by the partial submergence of an unglaciated river valley

- A series of additional Annex II species:
  - Sea lamprey
  - River lamprey
  - Allis shad *Alosa alsoa*
  - Twaite shad *Alosa fallax*
  - Otter

The two joint closest SSSIs unit within the SAC are Mildford Haven and Minwear Wood SSSI.

Mildford Haven SSSI unit bounds the section of route adjacent to Blackpool Mill. The SSSI overall covers an area of 2192.1ha. The SSSI citation also identified the following additional ecological receptors of interest:

- The site is of national geological interest
- Ancient woodland is a notable component of this site and contains a significant proportion of wild service tree *Sorbus torminalis* and a valuable assemblage of lichens and bryophytes including *Arthonia astoidestra* which is a national rarity
- The site supports rare and scarce plants and invertebrates and nationally important numbers of migratory waterfowl
- Greater and lesser horseshoe (Annex II) species are also active within the SSSI

### **Nationally Designated Nature Conservation Sites**

Two sites with statutory protection (Site of Special Scientific Interest (SSSI) have been identified within 1km of the route; Eastern Cleddau River and Milford Haven SSSI.

A breakdown of the designating features for these sites is set-out in the SAC section above.

### **Locally Designated Nature Conservation Sites**

The data search did not identify any non-statutory wildlife sites within 1km of the proposed route.

## **2.3 Species and Habitats**

### **Notable Amphibian and Reptile Species**

The data search identified records for three amphibian and four reptile species within 1km of the proposed route.

Of the 15 amphibian records returned the majority related to common frog *Rana temporaria* and common toad *Bufo bufo* (Environment (Wales) Act 2016, Section 7). A single record for palmate newt *Lissotriton helveticus* was returned. No records for great crested newt *Triturus cristatus* were identified within 1km of the route. All of the records relate to aquatic habitats within plantation woodland approximately 600m south of Blackpool Mill.

Records from the search suggest that adder *Vipera berus*, common lizard *Zootoca vivipara*, slow worm *Anguis fragilis* and grass snake *Natrix natrix* are active in the local area. All of these species are of local significance and are species of principal conservation importance. 15/16 records relate to the same areas of plantation woodland as that reported for the amphibians, with the last relating to plantation woodland on the western bank of East Cleddau River.

## Notable Bird Species

28 records relating to 15 different locally and nationally notable bird species were returned for habitats within 1km of the route. Species reported by the search were principally those associated with woodland and parkland habitats including wood warbler *Phylloscopus sibilatrix*, lesser redpoll *Carduelis cabaret* and spotted fly-catcher *Muscicapa striata* (Section 7, RSPB Red List), coupled with several raptor species including red kite *Milvus milvus* and merlin *Falco columbarius* (Section 7 / Schedule 1 WCA). A third of the records related to observations made within Canaston Woods, which straddles the route.

Records for marine and open water bird species, associated with the estuarine and peri-coastal areas on the fringes of the search were also reported, notable amongst these included green sandpiper *Tringa ochropus*, kingfisher *Alcedo atthis* and osprey *Pandion haliaetus*.

## Notable Invertebrate Species

Pembrokeshire Top SSSI and SAC is known to support the internationally rare Marsh Fritillary butterfly, in addition to this record the search identified 39 moth records relating to 16 different nationally notable species within 1km of the proposed route.

White sable moth, *Anania funebris*, a Red Databook Species (RDB) was recorded in Minswere Wood to the south-west of the route. The presence of 16 different, Section 7 species within a relatively small search area, would suggest that the quality of the local invertebrate assemblage is high.

The surveyor notes appended to these records confirm that these species were relatively abundant, although the records themselves are now relatively old (between 10-12 years old) and so the situation may have changed in recent years.

## Notable Plant Species

As described in Section 2.2 above the citations for the designated sites through which the route passes, or runs close to include reference to local and national rarities present in those sites. These are primarily species associated with the river and marine habitats.

Lower plants including rare and declining species of lichen, moss and liverwort are a notable part of the ground flora along hedge banks and within areas of woodland throughout the local landscape, with particularly notable concentrations associated with the East Cleddau River. The data search identified two Wales Red Data Book lichens within 1km of the route, beard lichen *Usenea articulata* and Lungwort *Lobaria pulmonaria*.

The search returned two records for bluebell *Hyacinthoides non-scripta* (Schedule 8/Wildlife and Countryside Act). Based on the coverage of ancient and plantation woodland in the local landscape the presence of native bluebell is to be expected along with a range of other ancient woodland indicator species<sup>4</sup>.

## Notable Mammal Species (excluding bats)

Records for five protected and notable mammal species were identified by WWBIC within the 1km search area. Just under half the records returned were attributable to otter, which is to be expected considering this species is a primary and secondary qualifying feature for all of the SAC's within 5km of the route.

Detailed review of the records confirm that otter have been confirmed up and downstream of the proposed crossing of Narberth Brook and adjacent to the route near Canaston Bridge and Blackpool

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<sup>4</sup> Ancient woodland indicators (AWIs) ancient woodland sites in particular geographical areas of Britain have been compiled by ecologists. By assessing the number of these species present in a particular wood, an educated guess can be made as to whether it is an ancient woodland site or not. Indicator species are useful tools, but the lists need to be used with caution and only those applicable to a particular area should be used in that area.

Mill. Surveyor notes associated with the records for Narberth Brook make reference to the presence of spraint, with those for Canaston Bridge including reference to a lying up area to the north of the A40 (outside of the zone of influence of these proposals), with no detailed information provided for the records at Blackpool Mill, these are mostly historic (more than 30 years old).

Nineteen badger records were identified by the search. Sightings of individual badgers and their tracks were reported by the search. Based on the distribution of these records they appeared to be influenced by surveyor effort, with the largest concentrations focused in areas subject to development associated with the A40. Based on the distribution of these records and the quality and suitability of habitat badgers are clearly active across the local landscape, although no specific badger records were reported within 100m of the proposed route.

Two records for polecat, a species protected under the Wildlife and Countryside Act, 1981 and The Conservation of Species and Habitat Regulations 2017 were returned by the search. The records relate to locations in the town of Narberth and to the west of the East Cleddau River.

Records for commoner mammal species including western European hedgehog *Erinaceus europaeus* (10 records), a species in dramatic decline and Section 7<sup>5</sup> species, as well as stoat *Mustela erminea* (3 records) and weasel *Mustela nivalis* (2 records) were also identified by the WWBIC search.

### **Notable Mammals Species - Bats**

19 records attributable to nine different bats species were found within 1km of the proposed route by the search. Based on the quality of the habitats present and review of the JNCC's recent report (JNCC, 2013) this is likely to be an underestimate of the diversity of the local bat population, as only a single Myotid species is listed by the search and it is reasonable to expect at least three to four of these species to be present in the local area.

Greater and lesser-horseshoe bats are species of the highest conservation concern (Annex II, CofSH) and are confirmed to have been active in the local area in the recent past. A roost near Blackpool Mill supporting between 10-20 Lesser-horseshoes had been subject to monitoring in 2003 and 2007, with foraging and commuting by greater and lesser-horseshoe bats recorded within the last five years.

Small numbers ( $\geq$  five records) for other commoner bats species including common and soprano pipistrelle, brown long-eared bats, Noctule and Natterer's bat were identified by the search. The majority of these records related to foraging or commuting bats. A roost supporting nine Brown long-eared bats, potentially consistent with a maternity roost for these species<sup>6</sup> was report for a site near Blackpool Mill in 2007, with a soprano pipistrelle maternity roost surveyed in a building near the A4070, along the proposed route in 2012.

### **Notable Fish Species**

The search returned six records for Atlantic Salmon *Salmo salar*, a species of principal nature conservation importance. Detailed scrutiny of these records indicate that Atlantic Salmon were recorded by the Environment Agency along the Narberth Brook including where the proposed route will cross (SN096145).

None of the qualifying species associated with SACs (detailed in Section 2.2) within 5km of the proposed route were found by the search.

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<sup>5</sup> Section 7 – Environment (Wales) Act 2016. Section 7 is a list of living organisms and types of habitat which are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales

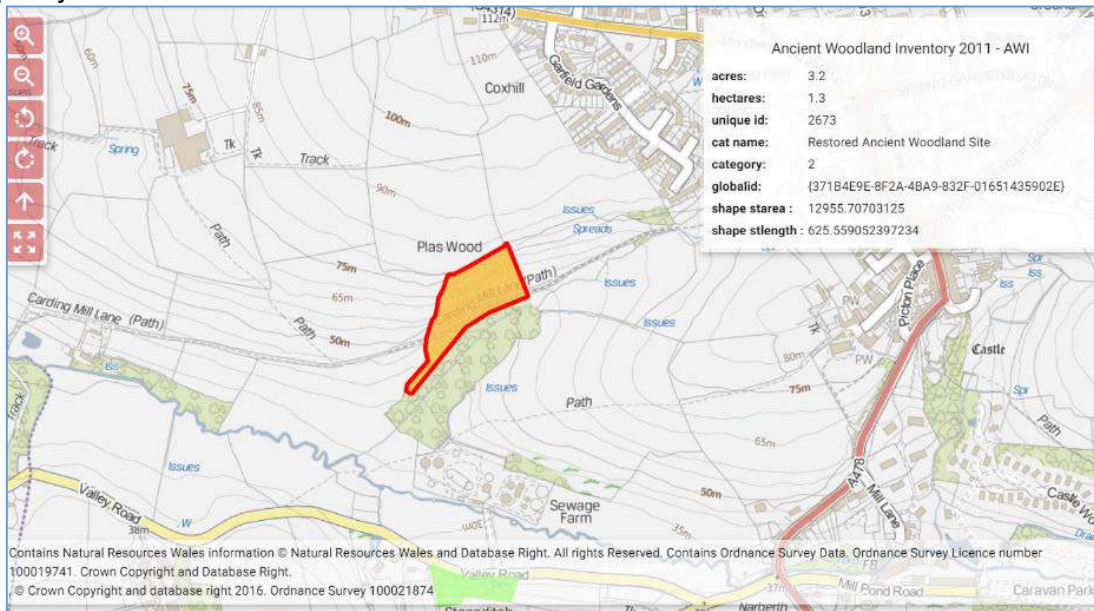
<sup>6</sup> Bat Conservation Trust (2010) Brown long-eared bat, *Plecotus auritus*  
[http://www.bats.org.uk/publications\\_download.php/213/brownlongeared.pdf](http://www.bats.org.uk/publications_download.php/213/brownlongeared.pdf)



## Notable Habitats

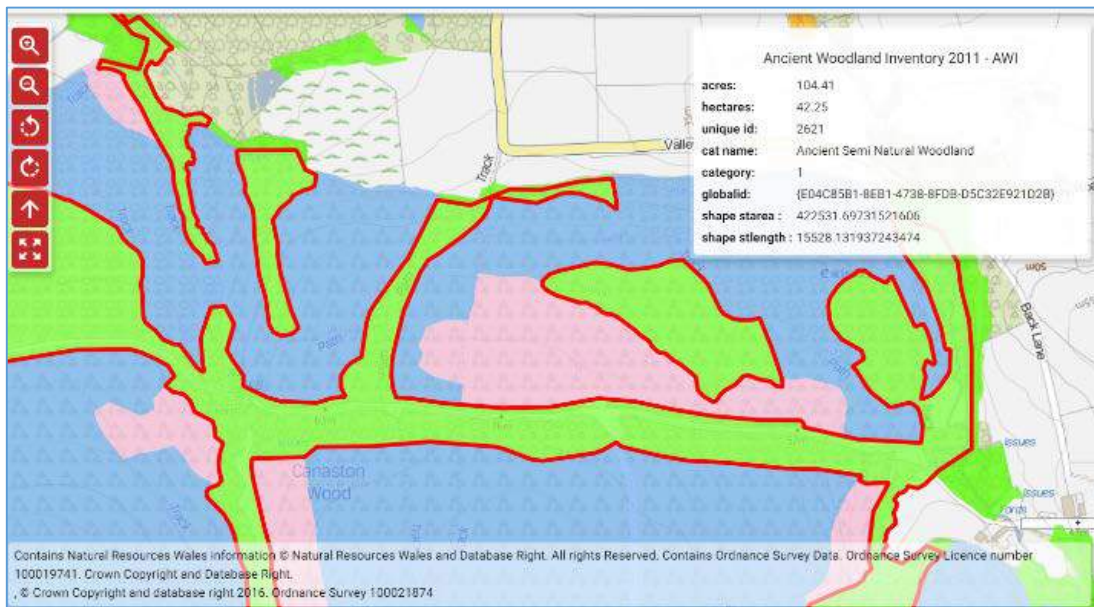
Plas Wood and Canaston Wood are listed on the Ancient Woodland Inventory (AWI) for Wales.

The balance of Plas Wood, north of the existing route and to a limited extent to the south is listed as a 'Restored Ancient Woodland Site' (**Figure 2.3.8.1**). The remaining part of the wood is not listed on the inventory, even though the habitats are contiguous and based on the surveyor's opinion of similar quality.



**Figure 2.3.8.1** – Extract from Ancient Woodland Inventory – Plas Wood, Narberth. Source: NRW

As shown on Figure 2.3.8.2 below, all of the woodland compartments along the proposed access route are listed as either Ancient Semi-Natural Woodland (ASNW), or Plantation on Ancient Woodland Soils (PAWS).



**Figure 2.3.8.2** - Extract from Ancient Woodland Inventory – Canaston Wood, Narberth. Source: NRW

### 3 Phase 1 Habitat Survey

The following habitat types were recorded along the proposed path improvement works;

- Bare ground;
- Broadleaved and Mixed Semi-Natural Woodland;
- Buildings and hardstanding;
- Dense and scattered scrub;
- Dry acid heath;
- Intact Species Rich and Poor Hedgerow, including hedgerow trees;
- Plantation woodland;
- Running water;
- Scattered trees;
- Semi-improved grassland; and
- Standing water.

#### Bare ground

##### Section A

Although the route followed existing stoned or metalled paths for the majority of its length, sections of the path had been left unmanaged and areas subject to regular footfall by people and dog walkers had developed in to patches of compacted and poached bare earth. This was principally either side of the path leading down from the car park (Plate 2.1), the prefabricated concrete bridge over Narberth Brook and along the edge of the stoned path within the woodland connecting from the bridge to the access road.

##### Section B

The majority of the route followed existing stoned footpaths and access track. Patches and strips of bare ground approximately 1-2m wide were noted where the proposed route travels up-hill in to Canaston Wood. The areas of bare ground appeared to correspond with the effects of water scouring along the edges of the access track (**Plate 2.2**). A narrow strip of bare earth 0.5-1m width was also noted along the edges of former track in the recently cleared area near the southern tip of Section B (**Plate 2.3**). A recently disturbed area of compacted ground (approximately 5-8m width) linked to recent renewal of the high pressure gas pipeline extended east of the track at NGR: SN 08246 14244. No notable vegetation was associated with the areas of bare ground.



**Plate 2.1:** Poached and bare earth along path (SN 10709 14636)



**Plate 2.2:** Bareground along edge of path, Canaston Wood (NGR: SN 08263 14276)



**Plate 2.3:** Bareground along edge of track, Canaston Wood (NGR: SN 08114 14015)

## Broadleaved Semi-Natural Woodland

### Section A

Several blocks of mature broadleaved woodland, including those listed on NRW's Ancient Woodland Inventory are present along the proposed route.

Plas Wood (W1) is located south-west of Narberth between NGR: SN 10612 14617 and SN 10201 14460. The woodland is mature, with the principal canopy species being a mixture of mature sessile oak *Quercus petraeus* (0.5m+ DBH) and sycamore *Acer pseudoplatanus* (**Plate 2.4**). The understorey within the woodland was well established and included hazel *Corylus avellana*, holly *Ilex aquifolium* and common hawthorn *Crataegus monogyna*.

The ground flora within the wood including edges of the access track was populated by a comparatively large number of ancient woodland indicator species including wood anemone *Anemone nemorosa* (f-lab), primrose *Primula vulgaris* (f), bluebell *Hyacinthoides non-scripta* (ab), wood sorrel *Oxalis acetosella* (occ) and opposite leaved golden saxifrage *Chrysosplenium oppositifolium* (f) (**Plate 2.5**).

A series of other commoner wood plants were also recorded within the woodland, along with a number of bryophytes including liverworts and a diverse assemblage of mosses.



A second block of broadleaved woodland (W2) is located along the route and straddles Narberth Brook – NGR: SN 09594 14485 to SN 09621 14413 (**Plate 2.6**). This woodland is located within East Cleddau River SSSI (Unit 1017).

Principal canopy species included mature sessile oak and common alder *Alnus glutinosa* many of which were very mature (0.4m dbh+) and supported features attractive to roosting bats (e.g. woodpecker holes and dense ivy cladding). Understorey coverage was dense and even across the woodland compartment and dominated by goat willow *Salix caprea*, hazel *Corylus avellana* and holly *Ilex aquifolium*.

The ground flora within the compartment included a high concentration of ancient woodland indicators, and those indicative of wet woodland (Habitat of Principal Conservation Importance). Commonly recorded species included wild garlic *Allium ursinum*, wood anemone, opposite leaved-golden saxifrage and marsh marigold *Caltha palustris* (strong wet woodland indicator species). Other indicators of wet woodland included the presence of meadow sweet *Filipendula ulmaria* and a small number of shallow ephemeral pools coupled with an abundance of bryophytes resistant to occasional to frequent inundation on the woodland floor.



**Plate 2.4:** Plas Wood (W1, Figure 3.1.1)



**Plate 2.5:** Plas Wood – AWIs: Wood sorrel and bluebell



**Plate 2.6:** Broadleaved woodland straddling Narberth Brook (W2, Fig. 3.1.1.)

## Section B

A series of mature broadleaved woodland compartments were located either side of the access track.

The block furthest north, forming the northern edge of Canaston Wood comprised a mono-culture of mature beech trees, with little or no ground flora or understory beneath. (**Plate 2.7**)

A second block of mature (0.3-0.4m diameter at breast height (dbh)) broadleaved woodland comprising relatively widely spaced mature beech trees (5-10m spacing) was mapped to the west of the track between NGR: SN 08225 14241 to SN 08111 14016. Understorey cover was low and comprised principally of holly, bramble, bracken *Pteridium aquilinum* and male fern *Dryopteris filix-mass.* (**Plate 2.8**).



**Plate 2.7:** Beech Woodland (W4, Fig. 3.1.2)



**Plate 2.8:** Beech Woodland (W5, Fig. 3.1.2)

## Buildings and Hardstanding

### Section A

The route followed existing surfaced paths for the majority of its length. For most of this the path is approximately 0.5-2m wide with an unsealed, stoned surface (**Plates 2.9 and 2.10**). A section of partially sealed tarmac path extends south from the car park at Narberth and then reverts to stone where the surface dressing has been eroded away (**Plate 2.11**), with a compacted stone access track measuring approximately 4m across between the junction with Valley Road and the edge of the woodland straddling Narberth Brook (**Plate 2.12**).

A 6m wide pre-fabricated concrete bridge supported by 4 piers crosses the Narberth Brook (**Plate 2.13**). The south eastern corner of the bridge had been restored using stone block. Clearance above the water level was low (less than 0.5m) and it is apparent that when the brook is in spate the top of the bridge is inundated, with the evidence of scouring present. Evidence of dogs climbing down the banks on either side were noted. The surface of the bridge was covered in pleurocarpus moss, with patches of cow parsley *Anthriscus sylvestris* growing in places.



**Plate 2.9:** Typical section of unsealed path



**Plate 2.10:** Typical section of unsealed path





**Plate 2.11:** Deteriorating tarmac path leading west from Narberth



**Plate 2.12:** Rolled stone path between Narberth Brook and Valley Road



**Plate 2.13:** Bridge over Narberth Brook

## Section B

The route is located along a mixture of existing stone paths and tracks. The stone paths are approximately 1-2m in width, with the tracks associated with the forestry operations within Canaston Wood 2-3 (occasionally 4m) in width (**Plate 2.14**). An access gate is present at the junction with Valley Road at the northern end, with a high pressure gas line crossing the route along a clearing within the wood (NGR: SN 08237 14245).



**Plate 2.14:** Existing forest track within Canaston Wood

## Dense Continuous and Scattered Scrub

### Section A

A single bank of dense scrub was located close to the public car park near Narberth. This bank of mature scrub was characterised by a mixture of sessile oak *Quercus petraea*, white willow *Salix alba*, underlain by a dense mat of bramble (**Plate 2.15**). Occasional scattered bramble and elder scrub *Sambucus nigra* was recorded along the fringes of the mature hedgerows extending west out of Plas Wood.



**Plate 2.15:** Dense scrub – right hand edge of photo (NGR: SN 10688 14641).

### Section B

A narrow belt (approx. 0.5-1m wide, 50m length) was recorded either side of the existing access track. Scattered scrub within this habitat comprised a mixture of bramble, silver birch *Betula pendula*, elder and hazel *Corylus avellana*. A larger area of naturally regenerating scrub between free standing semi-mature *Quercus petraea* and conifer trees was recorded between the main east-west forestry track and stand of beech and conifer at NGR: SN 08113 14015 (**Plate 2.16**). Hazel was the dominant species within this habitat, along with willow *Salix sp.* Bramble and bracken *Pteridium aquilinum*.



**Plate 2.16:** Dense and scattered scrub (NGR: SN08113 14015)

## Dry Acid Heath

### Section A

None recorded.

### Section B



A cluster of dwarf shrubs typical of upland, heath habitat were mapped to the south-east of the track near the northern entrance to Canaston Wood (**Plate 2.17, D1 Figure 3.1.2**). This habitat was characterised by clumps of common heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus* growing on the face and across the top of an existing bank punctuated by a mixture of self-set birch and mature conifer.

Other acid indicators recorded growing within this habitat included remote sedge, sheeps fescue and hard fern *Blechnum spicant*.

The grassland immediately to the west between the toe of the slope and the existing path (c.2m width) supported a mixture of acidic and neutral grassland indicators, bilberry and ling was absent from this narrow strip of habitat.



**Plate 2.17:** Dwarf shrub heath (D1, Fig. 3.1.2), Canaston wood

## **Intact Species Rich and Poor Hedgerow, including hedgerow trees**

### **Section A**

A line of mature oak trees was located along the eastern bank of a small channel which feeds south-west towards Plas Wood from near the car park. *Rhododendron ponticum* and bramble were the principal species beneath the line of trees (**Plate 2.18**).

Two continuous sections of species rich native hedgerow bounded the existing track extending from the western boundary of Plas Wood to Narberth Brook. The two hedgerows supported at least 5-7 woody species and supported features indicative of a mature and potentially ancient hedgerow (e.g. hedgerow bank and laid sections, as well as very mature hedgerow trees).

The hedgerow to the north of the track (H1) was mature (3-4m height, 2-2.5m width) and supported common hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, dog rose *Rosa canina*, hazel, blackthorn *Prunus spinosa* and elder *Sambucus nigra* (**Plate 2.19**). A number of mature English and sessile oak and ash *Fraxinus excelsior* trees, including those with bat roosting potential were recorded.

The hedgerow to the south of the track (H2) was also mature (1.5-3m height, 2m width) and in terms of woody species was more diverse than H1 (**Plate 2.20**). Woody species recorded included common hawthorn, blackthorn, elder, hazel, holly *Ilex aquifolium*, English oak, sessile oak, ash and sycamore *Acer pseudoplatanus*. Mature honeysuckle *Lonicera periclymenum* was also recorded

growing on the outer face of the hedge. H2 also supported a number of mature oak and ash trees, with a dense and continuous line of ash and sycamore recorded to the west.

The ground flora beneath the two hedgerows was exceptional and indicative of an ancient hedgerow as it was populated by a wide variety of ancient woodland indicator species; typical of undisturbed and ancient habitats. Ground flora species recorded included wild garlic *Allium ursinum*, wood anemone *Anemone nemorosa*, primrose *Primula vulgaris*, native bluebell *Hyacinthoides non-scripta*, and common dog violet *Viola riviniana* (**Plate 2.21**). H1 was found to support a greater cover of these species, with small discrete patches of less species rich, more rank ground flora found in locations subject to regular disturbance (e.g. gateways and passing places).

The hedgerows bounding the access track connecting to Valley Road were also mature with little evidence of recent management (H3 and H4). The two hedgerows were characterised by a mixture of pole stage ash and hazel (up to 5-7m height) interspersed by common hawthorn, holly and sessile oak. Mature sessile oak (0.4-0.5m Diameter at Breast Height) were scattered along the two hedge lines. Ancient Woodland Indicators were prevalent on both sides, with particularly high concentrations on the banks to the west. Additional AWIs recording along these two hedgerows included dogs mercury *Mercurialis perennis* and remote sedge *Carex remota* (**Plate 2.22**).

Several other intact, regularly managed agricultural hedgerows intersected with and radiate outwards from the more species rich hedgerows. A detailed examination of these hedgerows was not undertaken as they were considered to be outside the zone of influence of the proposals, however inspections using binoculars confirmed them mostly be comprised of a mixture of hazel, common hawthorn and blackthorn.



**Plate 2.18:** Line of broadleaved trees



**Plate 2.19:** H1, Section A





**Plate 2.29:** H2, Section A



**Plate 2.21** – Ancient woodland indicator (wild garlic along H1 and H2)



**Plate 2.22** – AWIs present along H4 and H5, Section A

### **Section B**

Two lines of mature hedgerow were recorded on the crest of a steep bank ( $\leq 2\text{m}$ ) either side of the narrow access track leading from Valley Road to the southern edge of Canaston Wood (**H5 and H6, Figure 3.1.2**). The hedgerow was largely continuous except for gaps to allow for field gates and associated access ramps (3-9m gaps). The composition of the hedgerow was similar on either side with beech *Fagus sylvatica*, hazel, hawthorn, holly, beech *Fagus sylvatica* and ash the main species. The width of the hedgerow varied along its length (0.5-2m thick) and varied between 8-10m in height, due to a lack of recent management (**Plate 2.23**).

The ground flora lining the banks was notable and included a mixture of ferns (e.g. male fern *Dryopteris filix-mas*, harts tongue fern *Asplenium scolopendrium* and shield ferns *Polystichum sp.*) and shade tolerant herbaceous species including dogs mercury (AWI), opposite leaved golden saxifrage *Chrysosplenium oppositifolium* (AWI) and lesser celandine *Ranunculus ficaria*.



**Plate 2.23** – H5 and H6, Section B



## Plantation Woodland

### Section A

A single small stand of mixed plantation woodland (**W3, Fig. 3.1.1**) was mapped at the southern end of the route adjacent to Valley Road (**Plate 2.24**). Series of semi-mature trees with the spiral guards still present had been planted on a narrow slope between the existing hedge line and the track. A mixture of scots pine *Pinus sylvestris* and hazel and oak were noted growing within this habitat. A small number of notable plant species including greater stitchwort *Stellaria holostea* (AWI), dogs mercury (AWI), early dog violet *Viola richenebacha* (AWI) were recorded growing on these area.



**Plate 2.24:** Plantation woodland adjacent to Valley Road

### Section B

Mature and immature plantation woodland are the dominant habitats on either side of the existing track.

To the east of the track, adjacent to the gateway in to Canaston Wood is a mature stand of mixed plantation woodland comprising an even mixture of beech and spruce (**W6, Fig. 3.1.2**). Understorey and ground flora within this habitat was minimal owing to the density of the canopy above. A further belt of mature, less dense mixed plantation is located approximately 30m to the south.

A stand of immature mixed conifer and broadleaved species was recorded to the west of the track near the gateway to Canaston Wood (**W7a, Fig. 3.1.2**). The trees were mostly 5-6m in height and included sessile oak, Scot's pine, larch and spruce. Broadleaves noted included multi-stemmed willow, guelder rose *Viburnum opulus*, dog rose, cherry *Prunus sp.* and silver birch. Bramble was the dominant ground flora species. A further narrow belt (approx. 6m width, 2-10m height) of mixed planting was recorded along the northern edge of the main woodland compartments approximately 20m to the south either side of the track (**W7b, Fig. 3.1.2**).

A stand of mature mixed plantation was mapped adjacent to the eastern edge of the existing track from NGR: SN 08225 14241 to SN 08111 14016 for a length of approximately 260m (**Plate 2.25; W8, Fig. 3.1.2**). Scot's pine and beech were the co-dominant canopy species, with hazel, beech and holly forming the principal understorey species. Small patches of dwarf shrub heath comprising clumps of common heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus* were recorded along the bank sloping down from the woodland compartment to the access track. Bramble was the dominant ground flora species within the compartment.



**Plate 2.25** – Mixed plantation woodland, W8 Fig 3.1.2

## Running Water

### Section A

A narrow 'v' shaped channel was noted to the north-east of Plas Wood (S1), along the edge of the existing amenity grassland close to the public car park in Narberth (**Plate 2.30**). The channel followed the line of existing mature oaks along the western edge of a field boundary. The channel was narrow (0.5m wide) and fast flowing. The cover of submerged, emergent or floating leaved vegetation was noted as being low with pendulous sedge *Carex pendula* and rhododendron growing along the banks.

Narberth Brook (S2) runs east-west through the route (**Plate 2.31**). The section of the brook which the route crosses is free flowing and measures approximately 3.5-4m width and supports a water depth of between 0.5-1m. The channel base comprised a mixture of sand and gravels, with occasional cobble. The brook had earth banks with evidence of recent erosion.

The coverage of submerged and marginal plants was found to be low (likely due to the extent of over shading vegetation), with the upper banks populated by woodland ground flora matching the composition of the wet woodland on either side.

Water quality appeared to be high, with no obvious surface pollutants, or other signs of pollution noted as part of the assessment.

A further ditch (S3) was noted flowing downhill towards Narberth Brook starting near to the junction with Valley Road. The stream was found to be narrow, steep sided and 'v' shaped measuring approximately 1-1.5m width. The stream had a silt and gravel base. At the time of the assessment the water level was low (0.2-0.3m depth) with a mixture of umbellifers and common nettle growing along the banks.





**Plate 2.30:** 'V' shaped ditch



**Plate 2.31** – Narberth Brook

#### Section B

No running water was identified.

#### Scattered Trees

##### Section A

A large number of scattered trees were present throughout the survey area.

Individual horse chestnut and naturalised tree species line the existing path leading west from Narberth. A further cluster of mature sessile oak located on a bank and adjacent to a ditch 25m north of the proposed route near the entrance to Plas Wood.

The two hedgerows leading west from Plas Wood (H1 and H2) also supported a number of very mature oak and ash trees, several of which had potential for nesting birds and bats (see Fig 3.1.1). A particularly notable sessile oak (**Target Note 1, Fig 3.1.1**) was recorded near to the homestead west of Narberth (NGR: SN 09847 14479). This tree supported a girth in-excess of 0.8m and based on its maturity was considered to have potential to develop into a veteran tree. The existing stone path passes directly through the root protection area of this tree.

##### Section B

The majority of trees formed part of existing woodland compartments. Four mature, free standing sessile oak were mapped where the proposed route met with the main east-west forestry track (**Target Note 10, Figure 3.1.2**). The specimen furthest to the north-east supported extensive sections of deadwood at 3m height and was considered to be of notable ecological value.

#### Grassland – Amenity, Improved, Semi-improved and Marshy grassland

##### Section A

An area of close mown species amenity grassland ran parallel with the route leading west from Narberth. A common assortment of sown grass (e.g. perennial rye grass *Lolium perenne*) and herbaceous species (e.g. white clover *Trifolium repens*) were recorded within this habitat. **Plate 2.32**. A further area of close mown and sown grassland surrounded a small portacabin in a field to the south-east of the route near to the junction with Valley Road.

The western approaches to Plas Wood from Narberth supported a mixture of dry and dampers areas of semi-improved grassland. The drier areas of grassland were characterised by a mixture of sown and naturally colonising grass and herbaceous species including primrose (AWI) complemented by a mixture of common fern species in more shade locations. The wetter areas, including those mapped as marshy grassland (**G1, Fig. 3.1.1**) to the south of the track were more species rich and included a range of moisture tolerant sedge and grass species. Notable amongst these included lesser

celandine, creeping buttercup *Ranunculus repens* (optionally large leaved), tufted hair grass *Deschampsia cespitosa*, meadow sweet, meadow foxtail *Alopecurus pratensis* and opposite leaved golden saxifrage. It was noted that this area of grassland had been close mown by the time of the June assessment, likely before the majority of these species had an opportunity to set-seed.

Other areas of semi-improved and improved grassland to the west of Plas Wood in the fields either side of the route were all sheep grazed and to a greater and lesser extent subject to agricultural management and improvement. Weed species (e.g. thistle *Cirsium sp.* and common nettle *Urtica dioica* coverage was low) with less accessible areas supporting a number of plant indicator species typical of more species rich grassland e.g. red fescue *Festuca rubra* and self-heal *Prunella vulgaris*.

## Section B

Two semi-improved grassland fields were present on either side of the track leading from Valley Road to the entrance to Canaston Wood. These were found to be comparatively species poor and dominated by palatable grasses including red fescue, Yorkshire fog *Holcus lanatus* and crested dogs tail *Cynosurus cristatus*.

An area of comparatively species rich grassland supporting a mixture of neutral and acidic meadow indicator species was recorded to the south of the area of new planting near the northern entrance to Canaston Wood (**G2, Fig 3.1.2**). The grassland sward appeared to coincide with the existing easement for the high pressure gas main and from a review of historic aerial photographs appears to have been in existence since at least 2009 (**Plate 2.33**). An even mixture of grasses, sedge and herbs were noted growing within the sward including glaucous sedge *Carex flacca*, crested dogs tail, sheeps fescue *Festuca ovina*, perforate St Johns Wort *Hypericum perforatum*, meadow vetchling *Lathyrus pratensis*, ribwort plantain *Plantago lanceolata*, hedge bedstraw *Gallium mollugo*, common knapweed *Centaurea nigra* and common birds-foot trefoil *Lotus corniculatus*. Wetter areas to the west support several moisture tolerant species including ragged robin *Lychnis flos-cuculi*. A small earth bank approximately 2.5m wide and 1m high ran from north-south parallel with the edge of the track, this supported similar species to the surrounding areas of grassland along with abundant soft rush *Juncus effusus*, tufted hair grass *Deschampsia cespitosa*, common yellow sedge *Carex viridula* and occasional patches of bramble.



**Plate 2.32** – Amenity grass, south of Narberth



**Plate 2.33** – Aerial photograph dated 2009

## Standing water

### Section A

A single pond located within the grounds of an adjoining property, to the north-east of Narberth Brook was identified and assessed (**Plate 2.34, P1**). This pond forms part of East Cleddau River SSSI, Unit 1017.

This rain and groundwater fed pond supported a notable assemblage of submerged and floating leaved species including stoneworts *Chara spp.*, potamogeton *Potamogeton sp.*, lesser spearwort *Ranunculus flammula*, water lily *Nymphaea sp.*, yellow flag *Iris pseudacorus* and abundant marsh marigold. Several commoner invertebrate species including water fleas and freshwater snails were noted within the water column.

### Section B

No standing water was identified in relation to this part of the route.



**Plate 2.34** – Pond 1, within East Cleddau SSSI



### 3.1 Importance of habitats present

Several Habitats of Principal Conservation Importance, listed under Section 7 of the Environment (Wales) Act were recorded along the route. The following table should be studied in conjunction with Figures 3.1.1 and 3.1.2.

Habitat of Principal Conservation Importance listed under Section 7, Environment (Wales) Act, 2016	Section A	Section B
Broadleaved mixed and yew woodland	Plas wood* (W1) / Wet woodland surrounding Narberth Brook (W2) <sup>***</sup> , W3	Canaston Wood – W4*, W5*, W6*, W7 <sup>**</sup>
Boundary and linear features	H1, H2, H3, H4	H5
Rivers and streams	S1, Narberth Brook (S2), S3	-
Standing and open water	P1	-
Dry shrub heath	-	D1
Neutral grassland	G1	G2

**Table 3.1.1** – Summary of Section 7 habitats along Section A and Section B of proposed traffic free route between Narberth and Canaston Bridge.

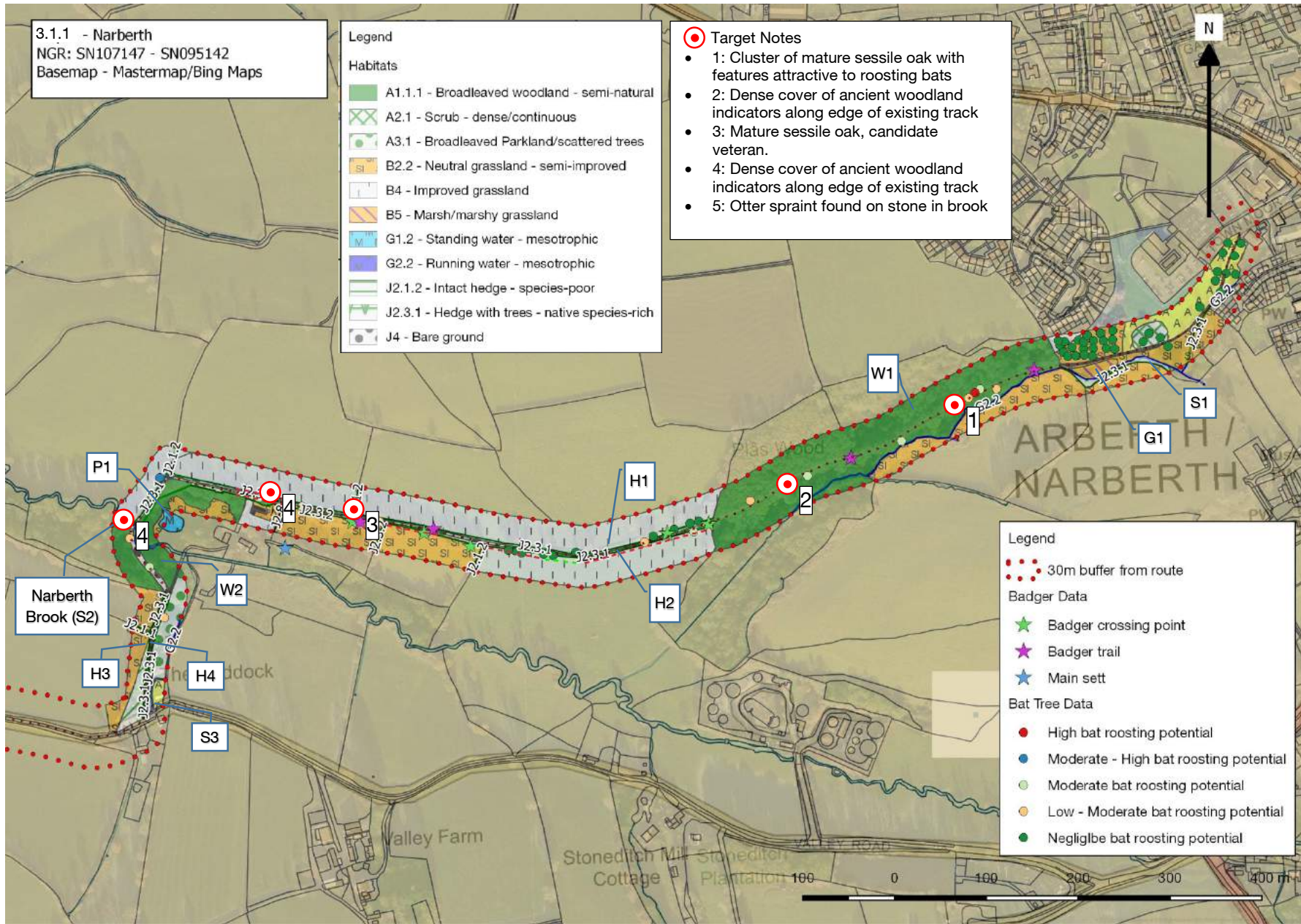
Notes: \* - Ancient Restored Woodland / Plantation on Ancient Woodland Soils, \*\* - Ancient Semi-Natural Woodland, \*\*\* - SSSI / SAC

The mosaic of semi-natural habitat present along the route is considered to have high importance for nature conservation locally. It has a high species and structural diversity and forms part of a series of interlinked natural habitats associated with Narberth Brook and Canaston woods. Within the mosaic along the route, the habitats of greatest importance are the watercourses, woodland habitats and mature hedgerows.

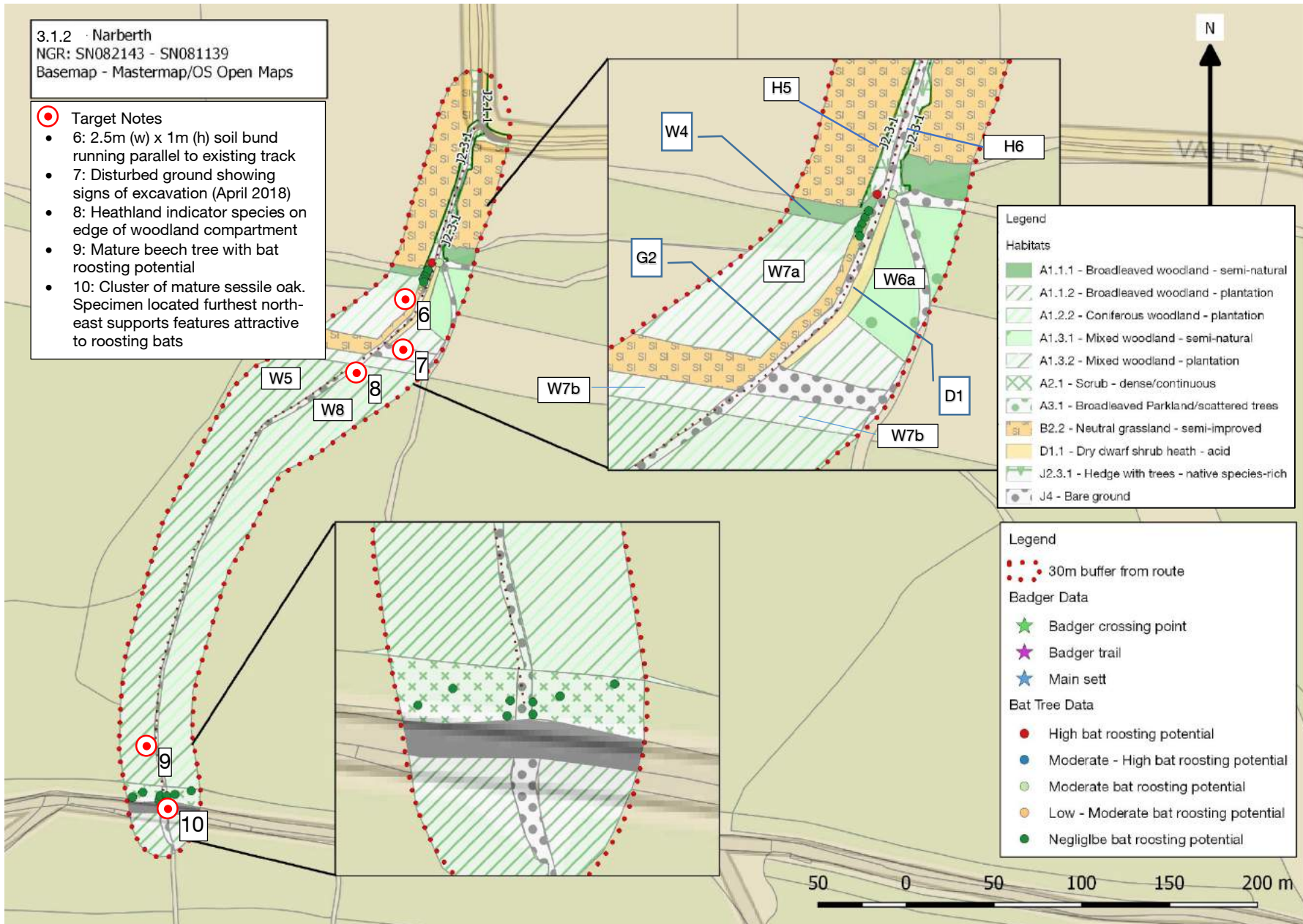
Narberth Brook forms part of East Cleddau SSSI and is located within Cleddau Rivers SAC. The brook is designated as it forms an important tributary for the East Cleddau River located approximately 3km to the west. The associated streams (S1 and S2) mapped within Section A feed in to the brook and therefore, although not covered under the same designation are of importance in maintaining the quality and ecological function of Narberth Brook.

The importance of Plas Wood and blocks of mature plantation and semi-natural woodland either side of the existing access track in Canaston Woods are recognised in their designations either as SSSIs, or areas listed on the Ancient Woodland Inventory for Wales. It should be noted that there is an existing path within this location and that grassland habitats bound the verges of the track between the entrance to Canaston Wood and the main woodland compartments to the south. Several of these habitats have also been significantly modified by the installation and subsequent maintenance of a high pressure gas line through this area.

The hedgerows, particularly those connecting Plas Wood with Narberth Brook (H1 and H2) are of significant ecological value owing to their maturity, structural diversity and the range of notable ancient woodland indicator species they support. Several of the mature trees embedded in these hedgerows are likely to provide suitable roosting opportunities for bats and birds.









## 3.2 Fauna

### Amphibians and Reptiles

WWBIC provided records of three common amphibian species. Of the 15 amphibian records returned the majority related to common frog *Rana temporaria* and common toad *Bufo bufo* (Environment (Wales) Act 2016, Section 7). A single record for palmate newt *Lissotriton helveticus* was returned. Other amphibian species including great crested newt could also be present. The absence of records does not indicate that a species is absent.

An eDNA assessment and box trap survey of Pond 1 was completed in April 2018. The eDNA returned a negative result (**Appendix 3**), with the box trap yielding a single female adult palmate newt. Based on these assessments, great crested newts are considered likely to be absent from Pond 1, with a review of aerial photographs and ordnance survey maps failing to identify any other suitable waterbodies for these species identified within 250m of either Section A or B.

The areas of woodland and semi-improved grassland (**G2, Fig 3.1.2**) all provide high quality foraging habitat for amphibian species. The habitat within the anticipated works area were primarily of low value to foraging amphibians (compacted stone track).

WWBIC provided records of four reptile species within 1km of the proposed route. These included records for adder *Vipera berus*, common lizard *Zootoca vivipara*, slow worm *Anguis fragilis* and grass snake *Natrix natrix*.

The habitat within the majority of the anticipated works area is considered of low value to foraging reptiles (compacted stone, or bare ground). These habitats could be used for basking, but are likely to be subject to high levels of disturbance from humans and dogs. The heavily over shaded sections of path and corresponding verge within the stands of mature woodland are also considered likely to be of lower value as potential basking or foraging sites for reptiles with the exception of the wetter/damper area within the south-western quarter of Plas Wood.

Optimal foraging and basking habitat was identified along the southern and western fringes of the several of the woodland stands including the western boundary of Plas Wood and south-eastern corner of W2. The southern edges of H1 and H2 could also provide a suitable warm and sheltered dispersal route for reptiles through the landscape.

The mosaic of scrub, grassland and developing woodland habitats north and south of the mature woodland compartment (**W5 and W8, Fig 3.1.2**) within Canaston Wood are of particularly high suitability as potential foraging and basking grounds for adder, slow worm and common lizard. This is principally due to their structural diversity and the high level of invertebrate biomass they are likely to support.

The existing stone and bareground tracks due to be renewed as part of the proposals offer minimal hibernation opportunities for reptiles. Suitable overwintering habitat in the form of deadwood and vegetation piles were noted either side of the track within Plas Wood and within the mature mixed plantation compartment to the east of the track in Canaston Wood (**W8, Fig 3.1.2**).

### Birds

WWBIC provided records of a large variety of bird species including seven species afforded additional protection whilst nesting under Schedule 1 of the Wildlife and Countryside Act (1982) and eight species with protection through their inclusion in Section 7 of the Environment (Wales) Act.

The majority of records returned were principally those associated with woodland and parkland habitats including wood warbler *Phylloscopus sibilatrix*, lesser redpoll *Carduelis cabaret* and spotted fly-catcher *Muscicapa striata*, coupled with several raptor species including red kite *Milvus milvus* and merlin *Falco columbarius*. It is likely that several of these species are resident within woodlands

along the route including Plas Wood and the plantation and semi-natural compartments at Canaston Wood.

A variety of bird species were noted incidentally as part of the assessment, these observations are detailed in the table below.

Common name	Scientific Name	RSPB Status
Nuthatch	<i>Sitta europea</i>	Green
Raven	<i>Corvus corax</i>	Green
Greater spotted woodpecker	<i>Dendrocopos major</i>	Green
Robin	<i>Erithacus rubecula</i>	Green
Chaffinch	<i>Fringilla coelebs</i>	Green
Jay	<i>Garrulus glandarius</i>	Green
Great tit	<i>Parus major</i>	Green
Coat tit	<i>Periparus ater</i>	Green
Chiff-chaff	<i>Phylloscopus collybita</i>	Green
Bullfinch	<i>Pyrrhula pyrrhula</i>	Amber
Wren	<i>Troglodytes troglodytes</i>	Green

**Table 3.2.1:** List of bird species recorded incidentally in April and June 2018 along Sections A and B of proposed new traffic free route between Narberth and Canaston Woods

A large variety of different habitats are present near the route, most of which could be used by foraging, nesting and roosting birds. Habitats of particular note for nesting birds along this route are the dense scrub, scattered trees and woodland.

### Fish

WWBIC provided records for Atlantic salmon along Narberth Brook, with corresponding citations for Cleddau River SAC and accompanying SSSI also making reference to brook lamprey, river lamprey and bullhead.

The presence of silts and gravels within the Narberth Brook provide suitable spawning grounds and nursery sites for river and brook lamprey<sup>7</sup>. The other streams and ditches mapped as part of this assessment (**S1 and S3, Figure 3.1.1**) are comparatively fast flowing, steep and have a different substrate and so are likely to be less suitable for these species.

The field survey identified sections of the Narberth Brook likely to provide suitable niches for adult and infant bullhead<sup>8</sup>. The greater part of the brook supported slow flowing, sheltered sections of watercourse with a small number of shallower more gravel rich, riffled sections identified as part of the otter survey.

### Invertebrates

WWBIC provided records of 16 different nationally notable moth species all listed on Section 7 of the Environment (Wales) (2016) Act. The citation for Pembrokeshire Top SSSI and SAC lists the internationally protected Marsh fritillary butterfly.

The aquatic and wetland habitats, mature woodland compartments and very mature scattered trees located in the survey area are likely to be important for invertebrates and could support notable species.

The habitats within the principal work footprint, primarily well used stone access tracks and paths, have a much lower value for invertebrates.

<sup>7</sup> <http://publications.naturalengland.org.uk/file/118013>

<sup>8</sup> <http://publications.naturalengland.org.uk/file/111020>

Narberth Brook and the corresponding ditches and streams which link to this (**S1 and S2, Fig 3.1.1**) all have the potential to support a range of aquatic macro invertebrates, which seems likely considering the range of protected mammal and fish species detailed within the SSSI citation which incorporates Narberth Brook. A limited sampling exercise of macroinvertebrates within the pond north-east of the brook (**Pond 1, Figure 3.1.1**) also confirmed the presence of a suite of common macroinvertebrates within this water body.

Significant deadwood habitats were noted along the banks of the existing access track within Plas Wood and within the wet woodland along Narberth Brook (**W2, Figure 3.1.1**). Hanging deadwood was also noted on several of the mature trees along the H1 and H2.

Habitat piles and lying deadwood was also noted within the stand of mature mixed plantation woodland to the east of the footpath within Canaston Wood (**W8, Figure 3.1.2**). These habitats have the potential to support a number of important sacrophyllic (deadwood loving) beetle species.

### **Mammals (excluding bats)**

Records for five protected and notable mammal species were identified by WWBIC within the 1km search area. Species reported included otter, badger, polecat, hedgehog, stoat and weasel. No records for hazel dormouse were returned as part of the search, with further discussion with the Planning Ecologist, confirming the closest record for this species to be approximately 5km from the route.

Evidence of otter activity in association with Narberth Brook was identified as part of the otter survey completed in June 2018. Signs comprised otter prints and fresh spraint. Two sets of fresh prints were found in fine silts on the northern bank of the brook 130m to the west of the existing crossing point, with a single spraint on a cobble located approximately 25m west (**Plate 3.2.1**).

No confirmed otter holts, or laying up sites were found, but the surrounding mature ash and alder trees lining the banks and wet woodland surrounding the brook would afford ideal opportunities for these species. The other ditches (**S1 and S3, Figure 3.1.1**) were considered likely to provide limited foraging and dispersal opportunities for otter, as their 'v' shaped nature provided a degree of screening from habitats subject to human disturbance nearby, however the low water levels and likely absence of prey species are likely to make them of lower value to otter.



**Plate 3.2.1** – Otter spraint along Narberth Brook (April 2018)

Signs of badger activity in the form of 'push-throughs', trails and a single active sett were recorded and mapped as part of the assessment (**see Figure 3.1.1**). The balance of activity was associated with field and woodland edges in association with the route within Section A. The sett encountered was considered likely to be a main sett supporting 4 active and 2 disused entrance holes.

No evidence of hedgehog, polecat, stoat or weasel was discovered as part of the assessment, although an exhaustive search for evidence of these species was not undertaken. Suitable habitats



for these species including for the purposes of foraging and sheltering was identified along the two sections assessed.

A more detailed scoping assessment of habitat considered likely to be of suitability to hazel dormouse was completed as part of the assessment. This included a habitat appraisal and hazel nut search. The findings of the assessment are presented in the Table 3.2.2 below.

Section	Site	Habitat description	Findings of hazel nut search
A	Plas Wood	Dominance of sessile oak and ash, little evidence of recent woodland management. Majority of hazel stool are over-mature (6-8m height). Reasonable levels of understorey cover including hazel (CA), field maple (AC), holly (IA), Sycamore (AP), bramble (RF). Honeysuckle also present (located away from edges of the existing path at least 3-4m in most places.	5 x 10m <sup>2</sup> areas sampled. 122 nuts collected. 41 whole nuts, 3 bird, 63 squirrel, 13 wood mouse, 2 bank vole, 0 hazel dormouse.
A	H1 and H2	Mature, intact species rich hedgerow. Level of human disturbance by walkers and dogs found to be relatively high.	-
A	Wet woodland surrounding Narberth Brook	Mature broadleaved, semi-natural woodland. Sessile oak, ash, alder, sycamore, hazel.	Coverage of hazel was variable/patchy across the wood. 111 nuts were collected over the course of 1.5hrs. 36 whole nuts, 6 birds, 55 squirrel, 8 wood mouse, 6 bank vole, 0 hazel dormouse
A	H3 and H4	Mature, continuous species rich hedgerow. Honeysuckle and range of potential other food species present supporting year round usage. Level of human disturbance by walkers and dogs is relatively high.	-
B	H5 and H6	Mature, moderately species rich hedgerow. Honeysuckle present, occasional standards. Hedgerow connects in to mature wet woodland to south and managed agricultural hedgerows to north.	-
B	W5	Mature beech woodland. Limited understorey beneath relatively widely spaced mature beech standards.	No hazel in understorey
B	W8	Mixed plantation woodland, good levels of understorey cover including abundant bramble and honeysuckle.	Too few nuts found.

**Table 3.2.2:** Hazel dormouse habitat appraisal and nut search for Sections A and B for proposed non-traffic route between Narberth and Canaston Bridge

Plas Wood supported suitable habitat for foraging and hibernating dormouse. Year round foraging opportunities for dormouse are provided in the understorey, although based on the findings of the nut search and habitat assessment, the closed oak/ash canopy above and lack of recent management has reduced the productivity of this habitat for dormouse. The nut search confirmed that a range of commoner small mammal species actively forage on hazel nuts within the wood.

H1 and H2 are of a suitable age, diversity and size to provide a suitable potential dispersal route for dormouse. The presence of a mixture of spring, summer and autumn fruiting wood species would provide foraging opportunities through-out the active dormouse period.

The wet woodland straddling Narberth Brook is mature, characterised by a dense closed canopy and supports a patchy distribution of fruiting and flowering understorey species attractive to dormouse. Several specimen trees within the wood support hollows and cavities, suitable for hibernating dormouse. The nut search confirmed that squirrel, wood mouse and bank voles actively feed on hazel nuts.

H5 and H6 are intact hedgerows with a reasonable assemblage of woody species of importance to dormouse, although appeared to be less productive than H1 and H2 owing to heavy shading by mature hedgerow and free standing trees on either side.

Compartment W5, which was the mature high beech woodland was found to be open and lacking in understorey diversity and cover. This habitat was considered to be of lower suitability for dormouse.

Compartment W8, in contrast, supported suitable habitat for foraging and hibernating dormouse. Although hazel cover was low, this was compensated for by the presence of other fruiting shrub and understorey species known<sup>9</sup> to be of value to dormouse including bramble, honeysuckle and ivy.

## Bats

All of the habitats along the route supported linear and point features of value to foraging bats. Likely hotspots of bat activity were associated with:

- W1 - Plas Wood
- W2 - wet woodland
- Narbeth Brook
- Pond 1
- W5 - Mixed plantation

Connectivity across the landscape and between these hotspots was good, with a lack of street lighting, or other artificial lighting sources providing suitable conditions for rarer, light sensitive species including lesser and greater horseshoe to forage.

Trees with bat roosting potential were identified along both routes, with concentrations within Plas Wood, along H5 and H6 and within the wet woodland near Narberth Brook. The locations and relative suitability as bat roosting sites are indicated on Figures 3.1.1. and 3.1.2.

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<sup>9</sup> PTES (2006) Hazel Dormouse: Conservation Handbook, Table 1, pg 12



## 4 Discussion and Assessment of Likely Impacts

### 4.1 Proposed Works

The proposal is to widen the existing path to 2.5-3m with an all-weather surface where possible, with minimum head clearance of 5m. Re-surfacing will need to consider dual use and so sections of flexipav as well as tarmac are proposed. It is anticipated that the minimum work footprint to create this path would be 5m when machinery is being used or 3m where sections are being built by hand.

In the long term, the minimum level of vegetation management that would be required would be mowing 0.5m either side of the path to prevent long vegetation into and obstructing the path (the frequency of mowing would depend on the vigour of the growth of vegetation) and occasional trimming of shrubs and trees to prevent branches impeding access along the path.

A detailed breakdown of the proposed engineer works are presented in the accompanying report for the route (Ref: Pembrokeshire NCNLink May 2018). For ease of reference, key proposals are bulleted below:

#### Section A:

- Improvements to drainage along path south of Narberth, within Plas Wood and in association with H5 and H6
- Improvements to existing concrete bridge over Narberth Brook including re-surfacing with tarmac and addition of parapets

#### Section B

- Regrading of existing slope associated with clear area above high pressure gas main between W4 and W5. Proposals are likely to directly impact upon establishing plantation woodland (W7a). The works in this location are intended to produce a more gentle and accessible slope.

At this stage, no additional external lighting has been proposed. Site compounds to allow for storage of equipment and materials are likely to be required, although their precise size and location are yet to be confirmed.

Based on the proposed dimensions detailed above and habitats mapped, the works relating to both sections will result in the loss of approximately 0.8ha of semi-natural habitat: 0.5ha along Section A and 0.3ha for Section B. This will principally be along existing footpaths (partially stoned, bare ground and areas of regenerating verge), but will also include natural and plantation woodland and semi-improved grassland.

This section considers the potential impacts of the proposal on designated nature conservation sites, habitats and protected and notable species. It also discusses whether these considerations are likely to form a constraint, or a barrier to the project.

### 4.2 Nature Conservation Sites

The route will pass through Eastern Cleddau SSSI and bridge Narberth Brook, which forms part of the Cleddau Rivers SAC.

Engineering proposals within the boundaries of the SSSI and therefore the SAC relate to improving the condition of the existing bridge in this location including its surfacing. As well as the sections of path which lead to and from the bridge.

For the purposes of clarity an abbreviated ecological impact assessment identifying the potential impacts of the scheme in the absence of mitigation for each qualifying, or designating species to the SAC is presented in the Table 3.2.1 below.

Cleddau Rivers SAC / Afonydd Cleddau – <b>Qualifying Features</b>	<b>Potential impacts</b>	<b>Anticipated ecological impact in absence of mitigation</b>
3260 – Water courses of plain to montane levels	<p>Construction phase - Pollution – eutrophication (increased soil deposition) / accidental release of petrochemicals when working on existing small crossing over Narbeth Brook and carrying out re-surfacing works within 50m of its banks.</p> <p>Operational phase – Increased human disturbance. Section of brook is already accessible.</p>	<p>Construction phase - Negative at International scale</p> <p>Operational phase – Neutral at International scale</p>
91EO – Alluvial forests, Important stands of wet, alder and ash rich woodland	<p>Construction – Tree loss/damage. Ground compaction damaging tree roots, setting of fires and accidental release of petrochemicals. Deadwood removal.</p> <p>Operational phase – Increased human disturbance (e.g. removal of deadwood, vandalism).</p>	<p>Construction phase – Negative (non-significant) at International scale</p> <p>Operational phase – Negative (non-significant) at International scale</p>
7110 - Active raised bog	Construction and operational phase – Proposed works areas are remote from areas of raised bog.	<p>Construction phase – Neutral at International Scale</p> <p>Operation phase – Neutral and International scale</p>
Sea Lamprey / River Lamprey / Twaute Shad / Atlantic Salmon / Bullhead / Otter / Allis shad	<p>Construction phase - Pollution – eutrophication (increased soil deposition) / accidental release of petrochemicals when working on existing small crossing over Narberth Brook and carrying out re-surfacing works within 50m of its banks.</p> <p>Operational phase – Increased human disturbance (e.g. increased numbers of domestic pets especially dogs causing disturbance to key species e.g. otter)</p>	<p>Construction phase - Negative (non-significant) at International scale</p> <p>Operational phase – Negative (non-significant) at International scale</p>
Greater and lesser horseshoe	<p>Construction phase – Negligible. Minor increases in noise disturbance. Roost sites and linear features left undisturbed.</p> <p>Operation phase – Installation of parapets would not form a barrier to dispersal, no additional lighting proposed.</p>	<p>Construction phase – Neutral at International scale</p> <p>Operation phase – Neutral at International scale</p>

**Table 4.2.1** – Ecological Impact Assessment Table – New path scheme and interaction with Cleddau Rivers / Afonydd Cleddau SAC

Based on the evaluation presented in Table 3.3.1, mitigation measures will need to be applied when working on the existing small bridge over Narberth Brook and when working within 50m of its banks to ensure that the scheme does not give rise to any significant adverse effects. Construction control measures will also need to be included to protect the mature trees along the path and those concentrated in the woodland to the south of the bridge.

Post-construction management measures will also be required to minimise potential affects from increased usage of the route by people and in particular their pets.

As the route passes through Unit 1017 of East Cleddau SSSI, works to the bridge and path construction will require a separate application and consent from Natural Resources Wales (NRW). The mitigation measures detailed in Table 5.3.1 would form a basis for the preparation of this consent, with the final detail agreed at the licencing stage, following receipt of planning consent.

No impacts are anticipated on other designated sites habitats due to the distance from the path, the small scale of the proposed works and the different habitats that the sites and the survey area contain.

No significant impacts upon any statutory or non-statutory nature conservation sites are anticipated in relation to Section B. This is based upon the relative distance between the proposed works and these sites, the small scale of the operations proposed and the mitigation to be applied to safeguard key habitats and species which may be present, which are discussed in the sections below.

### **4.3 Plants and Habitats**

For the majority of the route the only anticipated permanent habitat loss will be the loss of a narrow strip of vegetation either side of existing partially surfaced paths, this likely to range between 0.5m width in highly constrained locations (e.g. H1 and H2) to 1m either side in other areas (e.g. new access track near entrance to Canaston Wood). In locations where the path surface is either absent or has been entirely carpeted over by vegetation, permanent habitat loss will not exceed 2.5m width.

Temporary habitat disturbance is likely to be associated with the improvement of existing drainage along the existing path leading south-west from Narberth, Plas Wood and along parts of Hedgerows H5 and H6. Existing soils are likely to be temporarily cleared away to allow the installation of replacement drainage and then reinstated.

The setup and operation of a construction compound may also likely to lead to temporary habitat loss. The habitats immediately adjacent to the new path are also likely to be subject to greater management to prevent vegetation encroaching the path.

Verges of the existing path which are particularly species rich and notable, are those situated within:

- Section A - Plas Wood (Restored Ancient Woodland/Priority Habitat);
- Section A - H2 and H3 (Likely Ancient Hedgerow);
- Section A - Wet woodland/W2 (Cleddau Rivers SAC/East Cleddau SSSI);
- Section B - H5 (Likely Ancient Hedgerow)
- Section B – Canaston Wood - Dry shrub heath (D1 - Priority Habitat)
- Section B – Canaston Wood (PAWS/ASNW/Priority Habitat)

The scheme will lead to minor losses of habitats associated with these verges. The scale of loss is anticipated to be low, with the field survey gathering evidence to suggest that works would principally be focused on the removal of vegetation which has naturally colonised former sections of hard surfaced path. Measures to minimise, mitigate and compensate for the anticipated loss of these features will be required.

Proposed works may be situated within the root protection zones of mature trees and in close proximity to wetland habitats. Impacts on these have been discussed in Section 3.2.

No information has been provided in relation to the need for a site compound or storage of materials. These would cause some temporary habitat disturbance. The long-term impact of this temporary disturbance is dependent on the type of habitat that would be affected.



## 4.4 Fauna

This section discusses the likelihood of protected or notable fauna occurring at the site and assesses the potential for impacts to occur from the proposed works. This assessment takes into account species with statutory protection and species afforded protection through the Environment (Wales) Act, 2017, enforced through the planning process. Where appropriate other notable species are considered.

### 4.4.1 Amphibians

The field surveys, have confirmed that great crested newts (and other protected species of amphibian) are likely absent from habitats to be impacted along the proposed route.

No breeding habitat will be lost as a result of the development and the path will not create a barrier to amphibian movements, however the permanent loss of a small area of semi-natural habitat will reduce foraging habitat for amphibians such as common frog and palmate newt. Mitigation and compensation measures to minimise short-term impacts and provide long term benefits for amphibians should be developed.

### 4.4.2 Birds

A variety of common and widespread bird species were recorded during the different site visits. Nesting habitat for a wide range of common bird species is present along the two route sections. Given the location, the surrounding environments and quality of the habitats along each route, the presence of Schedule 1 species<sup>10</sup> cannot be entirely ruled out.

The trimming and cutting back of overhanging branches, scrub and tall ruderal vegetation have the potential to lead to the disturbance and destruction of birds' nests, if undertaken during the nesting season (March to September inclusive).

The anticipated scale of habitat loss is not considered likely to have any significant residual impacts on local bird populations, owing to the extent of suitable alternative habitat to be retained, or present within the local area.

### 4.4.3 Fish

An evaluation of potential impacts on internationally important fish populations associated with the Cleddau River and its tributary Narberth Brook is outlined within Section 4.2. In addition to these species the desk study identified that European eel *Anguilla anguilla* are active in water courses near the proposed route.

Works to the bridge in the absence of mitigation could have direct adverse impacts on the spawning and movement of these fish, with some potential for in-direct impacts, therefore mitigation measures will be required.

### Invertebrates

The desk study and subsequent field surveys have identified the presence of internationally important invertebrate species within the local area. No significant direct, or indirect impacts on any known populations are anticipated as part of the scheme. White sable moth and Marsh Fritillary were the two main protected and notable invertebrate species identified by the desk study.

White sable moth has been recorded relatively nearby in woodland at Minswere Wood. Minswere Wood is of a similar age and composition to that of several of the compartments within Canaston Wood. This species and in-particular it's larvae have strong preference for two herbaceous species found in open areas and woodland glades: Golden rod *Solidago virgaurea* and dyer's greenweed *Genista tinctoria*<sup>11</sup>. The field survey did not identify these species growing along the proposed route

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<sup>10</sup> Wildlife Countryside Act (1981) *Schedule 1*

<sup>11</sup> <http://ukmoths.org.uk/species/anania-funebris>

and so the proposals will not lead to the loss of larval food plants for these species. The temporary loss of semi-improved grassland is also considered unlikely to limit feeding opportunities for any adults which may be present during the construction phase, as habitat of similar and higher quality is adjacent.

An internationally important population of marsh fritillary butterflies are located at Yesberston Tops SAC, approximately 4.5km of the route. This species is sensitive to disturbance, with populations in South-Wales restricted to coastal grassland, or woodland clearings >1ha.

None of the grassland communities mapped as part of the habitat survey were consistent with coastal grassland. The belt of semi-improved grassland within Canaston Wood, covers an areas in excess of 1ha in area and so has the potential to support an outlying, satellite population of marsh fritillary. However, the key larval food plant devils bit scabious *Succisa pratensis* was not recorded within this area of grassland and so the presence of a breeding population is considered unlikely. Therefore significant impacts upon marsh fritillary are considered to be low. Opportunities exist to enhance retained areas for these species, and other more common invertebrates as part of the scheme post-construction.

### **Mammals (excluding bats)**

The desk study and subsequent field survey of the route identified evidence of usage by badgers, otter and other commoner species. A habitat appraisal and subsequent nut search found that mature hedgerows and broadleaved woodland along the route may have the potential for hazel dormouse.

Based on the information gathered to date the proposed construction works would not impact upon any active badger setts. An active sett was found approximately 100m south of Section A, with no signs of badger activity recorded along Section B. At least two parts of the route within Section A are within an active badger clans territory indicated by a series of 'push-throughs' and other signs consistent with badgers choosing either to walk along the path or cross it in key locations (e.g. western boundary of Plas Wood). Re-development of the path along Section A would not significantly impact upon badgers foraging routines as no fencing, or other barriers are proposed. Therefore at the current time (July 2018) the scheme is not likely to significantly impact upon these species.

As badgers are highly mobile and frequently establish new setts, further monitoring is recommended to ensure that any new sett creation within 30m of the route is mapped and mitigated for. Based on ground conditions and badger activity, the most likely location where badgers may choose to establish a new sett in the raised banks either side of H1 and H2.

The improvement of the existing path along this route will cause an increase in human activity. Given the existing usage of the route by walkers, horse riders and cyclists, the local badger population is considered likely to used to human activity. As a precautionary measure, the habitat creation and long-term habitat management at the site should allow ensure that sheltered foraging and commuting areas for badgers, independent from the path are maintained and enhanced.

Otters currently forage along Narberth Brook, no breeding sites or resting places for these species have been found within at least 75m of the existing brook crossing and therefore significant adverse impacts breeding otter are considered unlikely. As otter travel along the brook, construction works to upgrade the bridge and path within 50m of the brook will need to include mitigation measures to minimise disturbance to otter.

The habitat appraisal has identified that woodland and hedgerow habitats, particularly in association with Section A and to a lesser extent Section B are of a suitable age, structure and diversity to provide foraging and dispersal opportunities for hazel dormouse. The nut search did not identify any confirmed signs of foraging by these species, although this method is not designed to confirm the absence of dormouse.

Discussion with local stakeholders confirmed that dormouse had not been previously recorded, although the absence of records should not be taken as an indication that the species is not present.

Where there is uncertainty as to the presence of a protected species the 'precautionary principle' applies, this means that you should assume the presence of a protected species until you have convincing evidence to the contrary. As the proposed extent of vegetation removal likely to affect suitable dormouse habitat is low, a series of mitigation measures should be employed to safe guard this species, if present. The scheme should also include long term habitat management focused on providing improved foraging and breeding opportunities for hazel dormouse.

Other mammal species with no legal protection may occur in the area including species such as hedgehog that are Section 7 Species in the Environment (Wales) Act (2016). The path will not constitute a barrier to mammal movements. The project will result in changes to the habitats along the route and the landscaping and long-term management should aim to minimise negative impacts on mammal species and enhance the route for wildlife wherever possible.

### **Mammals - Bats**

No alterations to structures identified as having potential for roosting bats are anticipated as part of the scheme, in addition no lighting is proposed which might lower the accessibility, or suitability of these features for bats.

With increased public access, the bridge may need to be subject to greater levels of maintenance than currently required in the long-term. Any repair work that affects the structure of the bridge along the route would need to be preceded by an assessment for bats although it is anticipated that the likelihood of bats choosing to roost within the structure would remain very low..

Overall the site, is highly suitable for foraging and commuting bats and connects other habitats including the Cleddau River and complex of mature broadleaved woodland to the west. As the required extent of vegetation clearance is comparatively small and no significant habitat fragmentation is anticipated, implementation of reasonable mitigation and enhancement measures is considered sufficient to compensate for these impacts.

The field survey identified a number of trees of moderate to high bat roosting potential. It is anticipated that the vast majority of these will be left undisturbed by the works, with the root systems considered and protected as part of the works. A single tree located within Plas Wood which currently overhangs the path will need to be removed for Health and Safety reasons. Further ecological assessment and mitigation will be required to facilitate its removal.

### **Reptiles**

No evidence of reptile species has been recorded. The majority of the route is within shaded areas of lower suitability for these species. Habitats which may provide suitable basking and foraging opportunities for these species include the south facing bank of H1 and H2 along Section A and the mosaic of dry shrub heath, semi-improved grassland and developing plantation woodland at the northern end of Section B.

Construction works also have potential to result in reptiles being injured or killed in contravention of current legislation. Any construction involving the removal, or modification of these features would need to consider potential impacts upon these species.

As discussed above the construction of a traffic-free path has potential to result in the permanent loss of a relatively small area of semi-natural habitat. A compensation strategy would be required to maintain enough high quality reptile habitat, with features that can be used for shelter and hibernation, to maintain any existing population in the long-term.



## 5 Conclusions and Recommendations

The proposed route is approximately 7.1km in length and situated between Canaston Bridge and Narberth (SN 06593 15171 and SN 10795 14689). The main route primarily follows a mixture of public highway, existing unbound stone and earth tracks. Two discrete sections which would need widened and/or resurfaced have been assessed in detail: Section A is located between Narberth and Valley Road, Section B is located within the northern reaches of Canaston Wood.

Part of Section A will pass through and directly affect East Cleddau SSSI (Unit 1017) which forms part of Cleddau Rivers SAC. The works within the SSSI are considered to be of small scale and limited significance, however they will be subject to approval by NRW and in the absence of mitigation could impact on features of importance listed in the citation. A series of mitigation and pollution avoidance measures will need to be implemented to protect this feature, and the designating species it may support.

No impacts on statutory sites are anticipated in relation to Section B. Neither of the route sections will impact upon any non-statutory nature conservation sites.

The proposed regrading works within Canaston Wood would be located within land currently designated by the Ancient Woodland Inventory as Plantation on Ancient Semi-Natural Woodland (PAWS), or Ancient Semi-Natural Woodland (ASNW). The field survey confirmed that the majority of habitat within the footprint of the proposals had been cleared and replanted as part of the installation and subsequent maintenance of a gas pipeline and accompanying wayleave. As such, the habitats likely to be impacted by the current proposals comprise of a mixture of grassland, scrub and immature broadleaved plantation. These habitats increase the structural and floristic diversity of the wider woodland, but are readily re-creatable. The key ecological within this ecosystem is the ancient woodland soils. The permanent loss or deterioration of these soils would have a significant adverse ecological affect. A detailed ecological mitigation scheme would be required to minimise and mitigate for the proposals, which would need to be agreed with NRW as landowner and key ecological stakeholder. The preferred option would see existing soils retained and a raised boardwalk, or other piled solution found to avoid further compaction of the existing soils, or the requirement for excavation. Opportunities to remove the old, defunct sections of footpath through these areas should also be sought.

The works will lead to the loss of vegetation located across the surface and along the verge of the existing permissive route. Habitats and species of high conservation value have been identified in association with these locations, including those associated with ancient woodland. Based on the findings of the field survey, many of these habitats and species have naturally colonised areas which were surfaced in the past.

Locations of high ecological sensitivity include the edges of the path within Plas Wood (W1), the hedgerows which extend eastwards from Plas Wood towards Valley Road (H1 and H2), the woodland straddling Narberth Brook (W2) and those either side of the existing path in Canaston Wood (H5, W4-W7). The loss of these habitats will need to be minimised, with mitigation provided to offset and compensate for these impacts.

The scheme overall, will result in a permanent loss of semi-natural habitat. The overall area of habitat loss is not considered to be high (c.0.8ha), but given the high value and sensitivity in which it is situated it will reduce the existing structural and species diversity of the habitat. As such an appropriate series of mitigation and enhancement measures is essential to enable this scheme to progress.

The small bridge across Narberth Brook will be repaired and enhanced. These works in the absence of mitigation could have adverse effects on the brook due to increased siltation, bank erosion or release of petrochemicals. Specific mitigation and close monitoring of construction will be required to reduce these potential impacts to a satisfactory level.

Protected species of amphibian are considered likely to be absent, with potential for commoner species to be present. Construction methods and long term management will need to consider how these impacts can be avoided and compensated for.

Badgers actively forage and pass through parts of Section A. The 2018 survey identified a single active sett approximately 100m south of the route. Further badger monitoring is recommended to ensure that relevant wildlife legislation is complied with and that no active badger setts are disturbed as part of future construction works.

The scheme is anticipated to have a minor negative impact upon bats, principally due to minor habitat loss. No confirmed roosts will be impacted and existing linear features (e.g. hedgerows, lines of trees) will be retained. A single mature tree within Plas Wood has been identified as being a risk to Public Health and Safety and therefore should be removed as part of the proposed works. As this tree has potential to be used by roosting bats further assessment by a NRW bat licence holder will be required. In addition, any other mature trees identified as having bat potential will need to be subject to further assessment if works are subsequently proposed. The proposals provide an opportunity for additional roosting sites for bats to be provided.

Poorly controlled construction could cause damage to the root system of mature trees. It is anticipated that this impact can be minimised through adherence to best practice guidance for working by trees and consultation with the Local Tree Officer. Any trees removed, should be replaced on a ratio of 3:1, preferably by native species appropriate to local soil conditions (e.g. alder, English or sessile oak).

Rare and declining species of invertebrate form an important component of the local ecosystem in the wider landscape scale. The proposals are unlikely to lead to the loss of significant areas of habitat of value to invertebrates, or threaten important local populations. The scheme has the potential to provide improved foraging and overwintering opportunities for locally important species.

Section A and B are located within suitable habitat for hazel dormouse. The desk study and subsequent discussion with local stakeholders confirmed that hazel dormouse have not been recorded in the local area. The nut search completed as part of the PEA also failed to find evidence of this species in suitable habitats along the route. Based on the small scale of the works and findings of the assessment, a precautionary approach to address potential impacts upon hazel dormouse is proposed.

Works within 50m of Narberth Brook could disturb otter which are known to forage and move along this corridor. Based on current findings the proposals are not considered likely to impact upon any resting, or breeding sites attributable to these species. To minimise disturbance to otter, a series of precautionary mitigation measures will need to be implemented.

Whilst no long-term impacts have been identified on reptile populations from the proposals there is a small risk of these species being injured during construction primarily during any site clearance works. If any native reptiles species were to be killed, or injured this would be a contravention of current legislation. Given the small scale of works, it is anticipated that reasonable measures can be taken during construction to prevent an offence occurring.

No significant reduction in the quantity of nesting habitat is anticipated from this proposal but minor clearance of scrub or tall vegetation may be necessary where this overhangs the existing path, as a

result there is a chance this could result in disturbance to nesting birds, in contravention of current legislation. This impact can be readily avoided through timing of works.

Other notable species have potential to occur on site including hedgehog. Suitable precautionary measures will need to be applied when working within, or near habitats suitable for these species.



## 5.1 Recommendations

A series of mitigation and enhancement measures are required to offset and compensate the potential ecological impacts of the scheme.

**R1** Consultation with NRW is recommended in relation to all work within Plas Wood, East Cleddau River SSSI / Cleddau Rivers SAC and Canaston Wood. A series of mitigation and enhancement principles are set-out below to guide these discussions:

Site	Mitigation	Enhancement
Plas Wood	<ul style="list-style-type: none"> <li>- Minimise path width, passing places proposed in existing denuded areas and avoiding best areas</li> <li>- Works preceded by check for badger and dormouse by suitable qualified ecologist (SQE)</li> <li>- Work completed by hand where ever practicable (e.g. laying and installing flexipav)</li> <li>- Retention of all trees except those identified at imminent risk of failure. Any trees removed replaced on ratio of 3:1 of local provenance. Construction works completed in line with guidance stipulated in BS 5837:2012</li> <li>- No soil or other material to be taken off site</li> <li>- Any soils excavated to be placed on embankments on either side, or replaced carefully over excavations</li> <li>- All vegetation removal works completed outside of bird nesting period</li> <li>-</li> </ul>	<p>Preparation of a dedicated woodland management plan. WMP to include measures to favour:</p> <ul style="list-style-type: none"> <li>- Invertebrates</li> <li>- Bats</li> <li>- Groundflora</li> <li>- Hazel dormouse</li> </ul> <p>Coppicing of over-mature hazel coppice 20m either side of path</p>
East Cleddau River SSSI/Cleddau Rivers SAC	<ul style="list-style-type: none"> <li>- Preparation of detailed method statement in partnership with NRW and appointed contractor</li> <li>- Works preceded by check for otter and badger by suitably qualified ecologist (SQE)</li> <li>- Site compound including petrochemical store located outside of SSSI/SAC boundary</li> <li>- All works to follow current Pollution Prevention Guidelines (PPGs)</li> <li>- Controls to be applied in terms of construction lighting and noise generation</li> <li>- Erection of tree protection fencing to enclose work area and avoid construction creeping in to adjoining areas of high value woodland</li> <li>- Control measures to reduce the dispersal of dust, or other materials in to Narberth Brook and surrounding habitats will be required</li> </ul>	<p>To be discussed and agreed with NRW</p> <p>Hand removal of Himalayan balsam within 150m radius of existing crossing.</p>
Canaston Wood	<ul style="list-style-type: none"> <li>- Minimise requirement to remove, or disturb existing soils through the development of a raised walk-way, or piled solution</li> <li>- Measures to minimise ground compaction during construction phase to be developed</li> <li>- Maximise tree retention, with young more immature specimens selectively removed in preference to mature trees. Any trees replaced at a ratio of 3:1. Replacement trees to be broadleaved and of local provenance. Construction works completed in line with guidance stipulated in BS 5837:2012.</li> <li>- Avoid loss of dry shrub heath habitats</li> <li>- No soil or other material to be taken off site</li> <li>- Any soils excavated to be placed on embankments on either side, or replaced carefully over excavations</li> <li>- All vegetation removal works completed outside of bird nesting period and timed to co-incident with period when reptiles are active</li> <li>- Works preceded by check for dormouse by suitable qualified ecologist (SQE)</li> </ul>	<p>Remove defunct sections of path, de-compact ground and promote natural regeneration</p> <p>Control of gorse scrub along edge of path to favour heather and bilberry and other heathland species</p> <p>Creation of habitat piles for reptiles and invertebrates</p>

**Table 5.1** – Indicative ecological mitigation and compensation measures for sensitive habitats along sections A and B of proposed Narberth to Canaston Bridge path.

**R2 Trees** - The root systems of semi-mature and mature trees must be protected throughout the works in accordance with BS 5837:2012: Trees in relation to design, demolition and construction recommendations. Discussion with the Local Tree Officer, should be held post-planning to agree the method of work in these areas.

**R3 Pollution** - Construction must follow best practice guidelines (e.g. principles outlined in PPG5: Works in, near or over watercourse) in relation to working by water to prevent negative impacts on watercourses e.g. from pollution or siltation.

**R4 Reptiles** - To avoid the risk of injury to reptiles during site clearance, a suitable Reptile Method Statement (RMS) should be prepared. It is anticipated that the RMS would be prepared following receipt of planning permission and in-conjunction with the appointed contractor. The statement must detail the timings and sequence of works to minimise impacts upon reptiles, with specific reference to periods when works will need to be subject to checks by a Suitably Qualified Ecologist (SQE)<sup>12</sup>.

**R5 Birds** - Clearance of shrubs, trees and other bird nesting habitat should be undertaken outside the peak bird nesting season (i.e. works should occur October to February), taking in to account the requirement of the ARMS (R4 above). If this is not possible, vegetation must be subject to a nesting bird check by a competent ecologist prior to removal.

**R6 Badgers** - A survey for badgers along the two route section and accompanying 30m buffer (where accessible/appropriate) must be completed in advance of construction commencing. For the purposes of programming, it would be best to complete this survey in early spring or late autumn (Feb-Apr inclusive) or (Oct-Dec inclusive).

**R7 Hazel dormouse** - A series of precautionary measures are to be applied during site clearance works in respect of dormouse. These are to include the sensitive timing of works (taking in to account amphibians, reptiles, bats and nesting birds), with vegetation clearance completed between September to November inclusive. Vegetation clearance completed using hand tools, with a toolbox talk given to contractors responsible for any vegetation clearance indicating signs and measures to take should dormouse be encountered.

**R8** Ecological enhancements should be designed into this scheme. This should be in proportion to the scale of the proposal. The Local Authority and NRW may be able to suggest appropriate measures. A series of enhancement measures are detailed in R1 above. In addition to these:

- Four hibernacula should be built along the two sections of route to provide additional sheltering and over-wintering opportunities for reptiles and amphibians
- Installation of 10 timber bird boxes along each route section, supporting range of entry hole sizes.
- Installation of five dormouse nest boxes in-suitable trees along each route (set-back minimum of 5m from edge of path)
- Installation of 12 kent-style timber bat boxes along each route. To be erected in suitable trees at min. 4m height, with south and west facing aspect.

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<sup>12</sup> SQE – An individual ecologist who is covered by a professional code of conduct, subject to peer review and that their expertise and experience is appropriate for the assessed project.

## 6 Index and Bibliography

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## Appendix 1 - eDNA results