

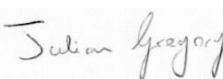
2022

Dovey Junction Viaduct No.1
Rail Asset Maintenance
Habitat Regulations Assessment (HRA)



AMCO GIFFEN



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1. INTRODUCTION

1.1 ASSESSMENT BACKGROUND

- 1.1.1 This document provides information to support an Appropriate Assessment under The Conservation of Habitats and Species Regulations 2017 (hereafter referred to as the 'Habitats Regulations') of scheduled structural maintenance of Dovey Junction rail bridge, to be undertaken by AMCO Giffen, on behalf of Network Rail (NR). The proposed works will be undertaken between August 2022 and completed by latter October 2022 (exact start date of works dependent on Marine License Assent).
- 1.1.2 This document also provides information to support determination of Site of Special Scientific Interest (SSSI) Assent by Natural Resources Wales (NRW).
- 1.1.3 Dovey Junction Viaduct No.1 is within the boundaries of the Llyn Peninsula Special Area of Conservation (SAC), and Dyfi Site of Special Scientific Interest (SSSI), Aber Dyfi Special Protection Area (SPA) and Cors Fochno and Dyfi RAMSAR. Therefore, the main statutory designated site which requires consideration under the Habitats Regulations has been identified as:
- ◆ Pen Llyn a'r Sarnau / Llyn Peninsula and the Sarnau (PLAS) Special Area of Conservation (SAC).
 - ◆ Aber Dyfi Special Protection Area (SPA).
 - ◆ Cors Fochno and Dyfi RAMSAR.
- 1.1.4 Also requiring consideration in relation to seeking SSSI assent for the works from (NRW). These are:
- ◆ Dyfi Site of Special Scientific Interest (SSSI).
- 1.1.5 There are several other designated sites within proximity to the project which are discussed further below in the following sections.
- 1.1.6 This document will be reviewed by the NRW SSSI Team responsible for this section of the Gwynedd Area. Following review and acceptance, this document will form part of the Marine License Application Band 2, which will be submit prior to the commencement of works along with a separate Water Framework Directive (WFD) Assessment undertaken by AMCO Giffen.
- 1.1.7 EcoVigour Ltd have been commissioned to produce these documents for AMCO Giffen Ltd, the principal contractor, working on behalf of Network Rail.
- 1.1.8 Under the requirements of the European Council Directive 92/43/EEC 'The Habitats Directive', it is necessary to consider whether projects or plans may have significant effects upon areas of nature conservation importance designated/classified under the Directives. This requirement is translated into UK law through the 'Habitats Regulations'.



1.2 PROJECT BACKGROUND

- 1.2.1 Network Rail engineers have designated the specific components making up the structure (Railway Viaduct) at Dovey Junction as “Operationally Life Expired”, consequently, through the GRIP stage framework, Network Rail have commissioned the principal contractor (AMCO Giffen Ltd) to undertake superstructural maintenance and replacement of specific components support the structure.



Figure 1: Dovey Junction Viaduct No.1 (From western shore).

- 1.2.2 The Underbridge Replacement is scheduled to be undertaken between August 2022 to October 2022.
- 1.2.3 Some portions of the work that require no rail traffic have been scheduled to occur during the abnormal rail possession implemented by Network Rail during September 2022, this will feature line closures over a significant portion of the Dovey Line to allow for network repairs and maintenance elsewhere.
- 1.2.4 Preparation works and de-mobilisation or project assets will occur before and after the possession dates as those tasks will not relate to an open rail corridor.



2. LEGISLATIVE CONTEXT

2.1 OVERVIEW

- 2.1.1 This document provides information to support an Appropriate Assessment under the Habitats Regulations of the proposed works by AMOC Giffen Ltd on behalf of Network Rail at Dovey Junction Viaduct No1.
- 2.1.2 The Habitats Directive, transposed into UK legislation through the Conservation of Species and Habitat Regulations (2017) (Article 6 of European Council Directive 92/43/EEC), any plan or project not directly connected with, or necessary to, the management of a European designated site but likely to have a significant effect, either alone or in combination with other plans or projects, shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives.
- 2.1.3 If the Appropriate Assessment concludes that the proposed works may have an adverse effect on the integrity of a European Site, or that such an effect cannot be ruled out (in line with the recognised precautionary principle) avoidance and mitigation measures to avoid such an effect must be considered.
- 2.1.4 If it cannot be concluded that the proposed works will not have an adverse effect upon the integrity of the site(s), further measures and assessments would be required. Potentially in the form of compensation.

3. METHODOLOGY

3.1 OVERVIEW

- 3.1.1 This assessment has been produced in-line with Habitats Regulations guidance published by the JNCC (2010), English Nature (now Natural England) (2001) and the Countryside Council for Wales (now Natural Resources Wales) (2008).
- 3.1.2 Dovey Junction Viaduct No.1 rail bridge is located within the PLAS SAC, Dyfi SSSI, SPA and lay directly adjacent to the Cors Fochno RAMSAR, with structures length representing a boundary line of the RAMSAR site.
- 3.1.3 Additionally, there are other SSSI's within proximity to the project which will be discussed in further detail within the scoping-out section below.
- 3.1.4 Non-Statutory sites such as Ancient Semi Natural Woodland (ASNW), Local Nature Reserves (LNR) and National Nature Reserves (NNR) are within proximity to the rail structure and proposed compound area. However, in relation to the ANSW, no works will occur within or directly adjacent to these sites and will not be discussed further.
- 3.1.5 Regarding the LNR and NNR, these sites share similar boundary extents as the above statutory sites and therefore will benefit by proxy, from this assessment and control measures. These sites will not be discussed in further detail as they overlap with above sites.
- 3.1.6 This Habitat Regulations Assessment (HRA) will focus on the potential likely significant effects (LSE) of the rail structure refurbishment on the Llyn Peninsula SAC and Afon Mawddach SSSI designated sites.



4. DESCRIPTION OF THE PROPOSED ACTIVITIES

4.1 SITE CONTEXT

- 4.1.1 Dovey Junction Viaduct is located on the Dovey Junction to Pwllheli line (DJP) over the River Dovey approximately 5 miles south-west of Machynlleth (Grid Ref: SN 69465 97892).
- 4.1.2 A single project compound is to be utilised, which is situated near an existing Network Rail, Road Rail Access Point (RRAP), approximately 300m west of the bridge structure at Ynys Crossing. Figure 2 & 3 below illustrate the sites location in relation to the wider area and PLAS SAC.

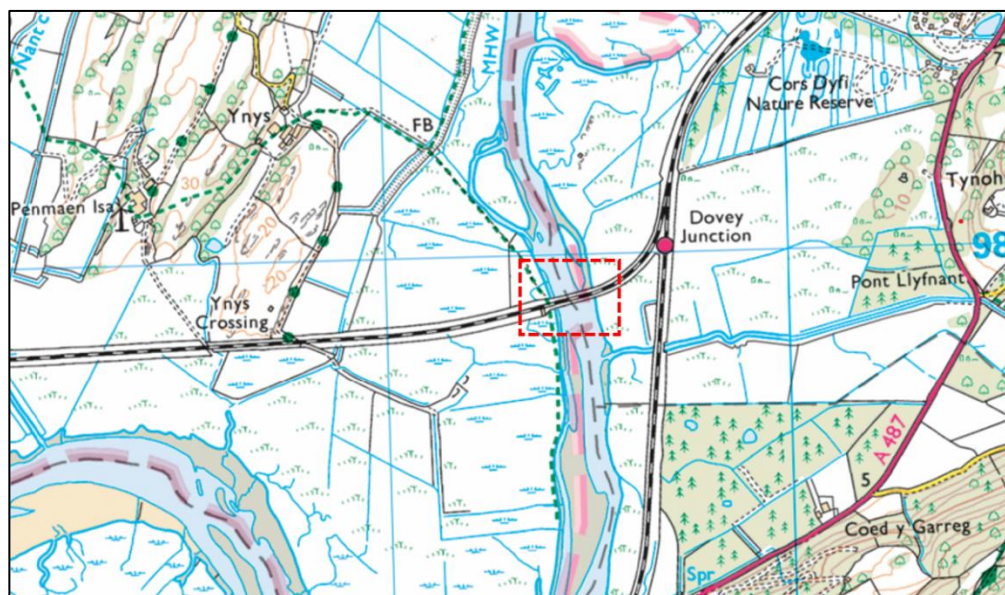


Figure 2: Main works location (OS Map).

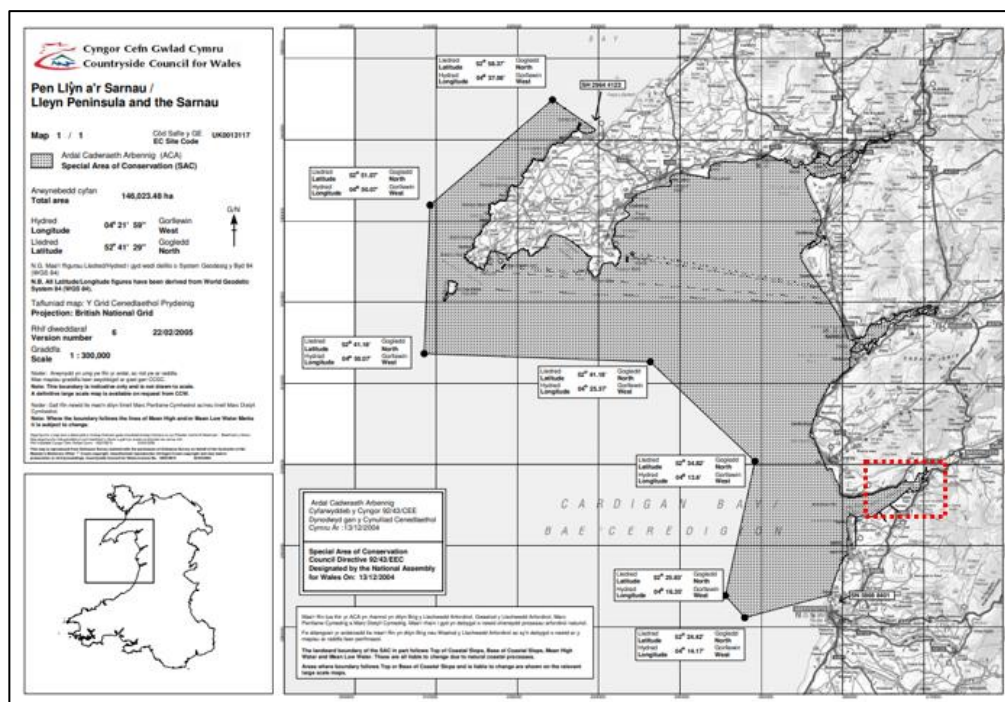


Figure 3: Location within wider context to PLAS site.



4.2 PROJECT OVERVIEW

4.2.1 The project methodology can be found within the separate method statement document found in Appendix B. The sub sections below will outline the project deliverables, general work stages and program (Table 1).

4.2.2 Project deliverables:

- ◆ 19 No piles replace
- ◆ 11 No lower horizontal walings replaced
- ◆ 19 No Diagonal wailings replaced
- ◆ All associated metallic fixings and straps replaced
- ◆ Capacity and condition led steel work repairs top metallic spans
- ◆ Full grit blast to SA2.5 and apply paint system to achieve a 25-year design life.

4.2.3 The sequence of works can be summarised below:

1. Pre-Abnormal Possession

- a. Establish site compounds to the high and low mileage of the bridge, satellite to low, main to high
- b. Use RRVs in RoR possessions to transfer temporary works material to site
- c. Install temporary works and change piles (outside only), diagonal and horizontal wailings with trains running
- d. Install scaffold access to the full structure and encapsulation to the metallic section
- e. Grit blast and paint outside beams
- f. Install lateral restraint temporary works between crossheads

2. During Abnormal Possession

- a. RRVs access site to high and low mileage of structure
- b. Change piles 3 and 4 across structure where required
- c. Grit blast and paint track element of steel spans

3. Post Abnormal Possession

- a. Remove temporary works
- b. Carry out any finishing works
- c. Site demobilization

Table 1: Project Program

Activity	Duration
Site set-up; inc. compound, dilap and utilities surveys	From 14th to 29th July 2022; 2-weeks
Pontoon installation	From 2nd September to 8th September 2022; 1-week
Scaffold installation	From 2nd September to 29th September 2022; 4-weeks
Blockade works to replace timber elements	From 11th September to 6th October 2022; 3.5-weeks
Grit blast and paint metallic structure elements	From 30th September to 16th November 2022; 6.5-weeks
Scaffold removal	From 17th November 2022 or after 14th April 2023* (removal would take up to 2-weeks).



4.3 PROJECT SETUP

- 4.3.1 The compound will be required to be of sufficient size to allow storage of materials and site cabins, the compound will be located as per the plan above on land adjacent to the railway crossing. Parking of staff and operative's vehicles will be within the compound area.

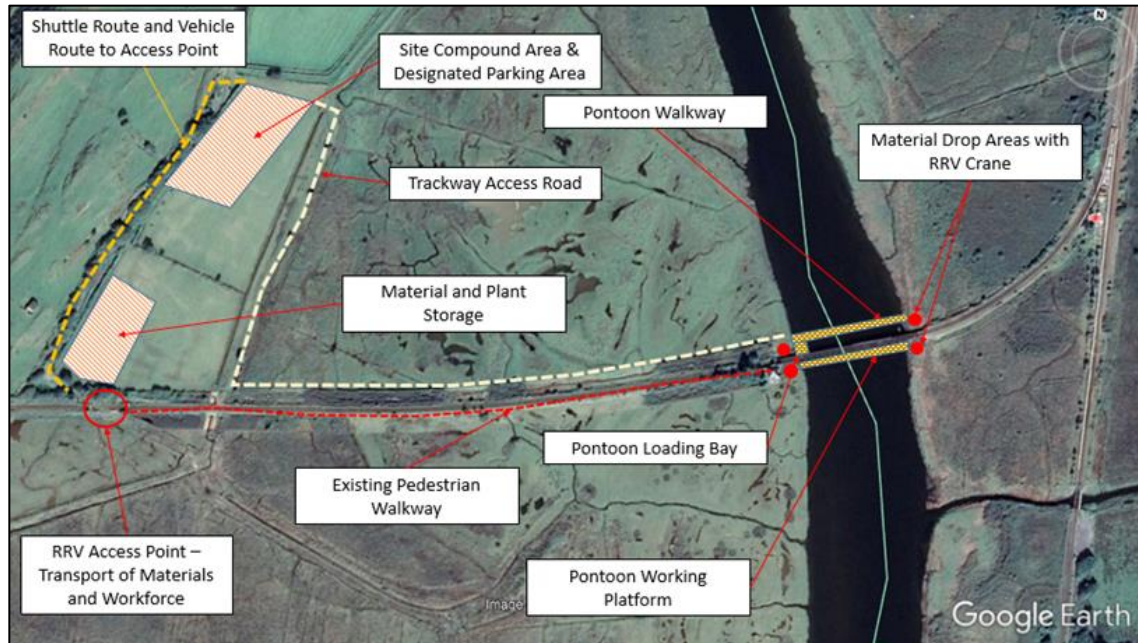


Figure 4: Project Layout

- 4.3.2 Arrival of equipment and temporary cabins is likely to take the majority of the overall project time, with preparation the key component prior to utilising the upcoming Autumn Rail blockade.



4.4 CHANGE HORIZONTAL AND DIAGONAL WAILINGS

- 4.4.1 The timbers will be brought to the shore in a Saturday night possession using RRVs. They then get loaded onto pontoon by telehandler.
- 4.4.2 The works to the wailings will take place in normal working days ahead of the abnormal possession. This process has been previously agreed with the designers as long as certain criteria can be met.
- 4.4.3 The wailings can be changed on a one out one in process only. All steelwork will be replaced and the wailings cannot be left off outside of a shift.



4.5 CHANGING THE STEEL TIES

- 4.5.1 Where the existing ties are too rusty to be undone, they are cut using a Stihl saw or similar and removed. The new pre-cut timbers are taken to site on a tractor and trailer. One of the pair of horizontals is removed by the excavator and grab, then placed on the sand.
- 4.5.2 The new timber is lined up against the old and is used as a template to drill the new holes for the stainless steel fixings. Once drilled it is positioned over the new tie bars and loosely bolted into place. The process is repeated for its opposite timber. Once the pair of new are in place, the bolts are secured and the old timbers and fixings removed back to the yard.
- 4.5.3 The old timber will be examined and where possible put to one side to be cut for reuse on the structure, should the beam be beyond serviceable use it will be recycled.



4.6 REPAIR AND REPLACEMENT OF UPRIGHTS

- 4.6.1 Vertical pier replacement will require the localised excavation around selected piers during low tide conditions to gain access the lower timber material. This will occur at two individual uprights (piles). The excavation will be up to 1m in depth and approx. 1m in width to allow for safe access.
- 4.6.2 The location of the piers is along the bank over the river, away from the continuously flowing portion of the estuary during low tide.

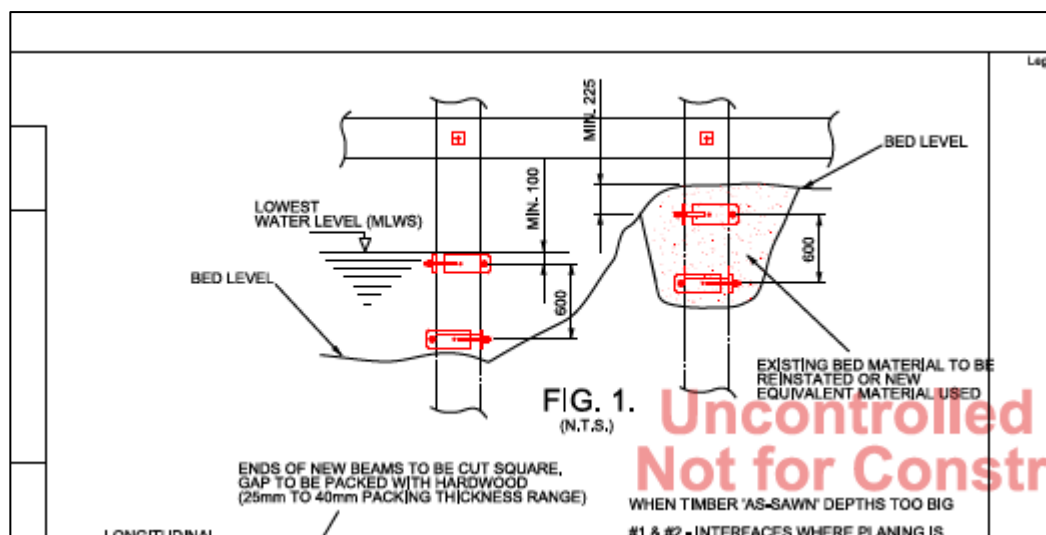


Figure 5: Pier excavation cross section.

4.7 DEMOBILISATION

- 4.7.1 Once the structure is in essences, at operational readiness, the temporary scaffolding and crash deck below the structure will be removed.
- 4.7.2 Any cosmetic tasks will be undertaken, and drainage outfalls realigned to previous designs.
- 4.7.3 Excavated material removed from either side of the structure will be removed from site via a registered waste carrier.
- 4.7.4 Upon final structural checks, the public-footpath below the structure will be re-opened to the general public.
- 4.7.5 Final demobilisation and removal of cabins, machines, and equipment.



5. HRA METHODOLOGY OBJECTIVES

- 5.1.1 Habitats Regulation Assessment is an assessment of the potential effects of a proposed project / maintenance activity on a European site(s) (alone and/or in combination with other plans and projects). The Habitats Regulations promotes a hierarchy of avoidance, mitigation and compensatory measures. First, the project should aim to avoid significant adverse effects by identifying potential measures to avoid these effects.
- 5.1.2 Where adverse effects remain, mitigation measures should be applied to a point where these effects are no longer significant. If sufficient mitigation measures cannot be applied, the project should not be taken forward in its current form. In such a scenario, the project will require an assessment to identify alternative solutions that deliver the project in a form that avoids any significant adverse effects.
- 5.1.3 Where significant adverse effects remain, compensatory measures will be required if the project is to proceed. However, the application of such measures will only be permitted if no alternative solutions exist and the project is required for imperative reasons of overriding public interest (the 'IROPI' test).



6. DESIGNATED SITES WITHIN PROXIMITY TO SITE

6.1.1 There are several statutory designated sites within proximity to the project.

- ◆ Dyfi Site of Special Scientific Interest (SSSI).
- ◆ Pen Llyn a'r Sarnau / Llyn Peninsula and the Sarnau (PLAS) Special Area of Conservation (SAC).
- ◆ Aber Dyfi Special Protection Area (SPA).
- ◆ Cors Fochno and Dyfi RAMSAR.

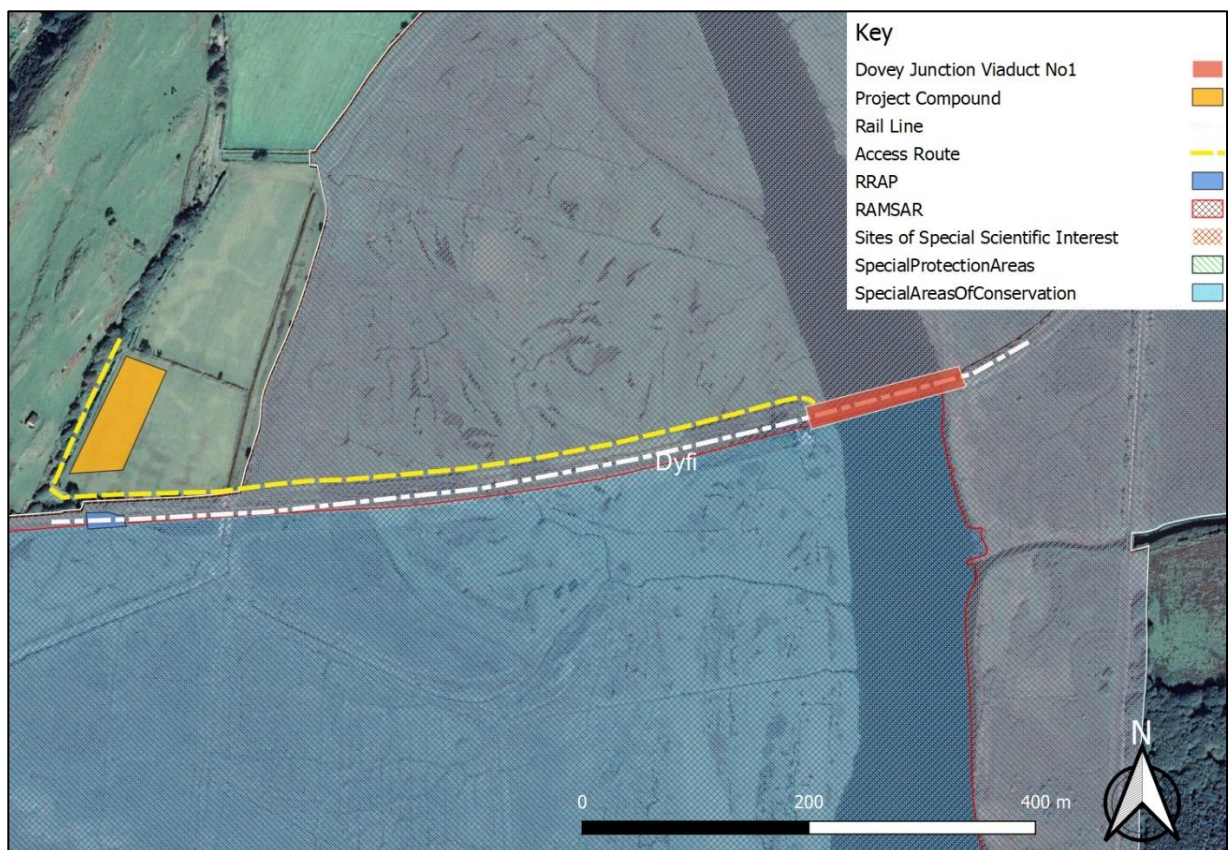


Figure 6: Designated sites in proximity to structure.

- 6.1.2 As Coed y Gofer SSSI is designated for its in situ biological features and is a significant distance away from the project, it will not be considered further in this assessment.
- 6.1.3 In regard to the SPA and RAMSAR sites, as the main features overlap, these two designations will be discussed within the same section.
- 6.1.4 The West Wales Marine (WWM) SAC boundary is outside of the project boundary but is however connected via the Dyfi estuary. Although this site will not be discussed specifically, this assessment does acknowledge the importance of the marine site and consequently, the mitigative measures to be implemented for the project will ensure the protection of the key habitat and species features outlined within the WWM conservation objectives.



7. CURRENT ON SITE CONDITIONS

- 7.1.1 An initial site walkover was undertaken on the 06/05/22 to inform this Appropriate Assessment. The figures below illustrate the habitat polygons available via the Lle Data portal and images from the walkover with further disruption.



Figure 7: Map data via Lle Portal.

- 7.1.2 The available data sets in this area are primarily limited to Saltmarsh units, however there are defined mudflat units further upstream and downstream of the structure. The figure above should be viewed as a broad overview as several habitats are missing.



Figure 8: Habitat below structure (western shore)

- 7.1.3 From the figure above, the habitat is comprised of the salt marsh edges, with more consistent grazing along the upper shore outside of the tidal reach. Intertidal mudflats is present, interlaced with deposited stone and other sediment between the toe of the marsh and mudflat habitat.



Figure 9: Mammal paw prints. Note: potential hind Otter paw print, middle right)

- 7.1.4 During the walkover, an abundance of paw prints were observed within the mudflat exposed during the low tide. Otter prints were observed upstream of the structure on the western exposed shore.



Figure 10: Rear of estuary shore, facing south east.

- 7.1.5 Behind the shore is a grazed portion of the marsh habitat. Significant patches of *Juncus* is present (see figure 9 above), while a tall reed bed runs the length of the rail corridor on the northern side, following the existing drainage channel (see figure 10 below).



Figure 11: Following proposed access route along northern rail boundary fence.



Figure 12: Access gate and raised ground between grazed marsh habitat and field proposed for compound use.

- 7.1.6 The access route is proposed to utilise existing crossing where suitable, and run as closely to the Network Rail boundary fence as possible.



8. DYFI SSSI

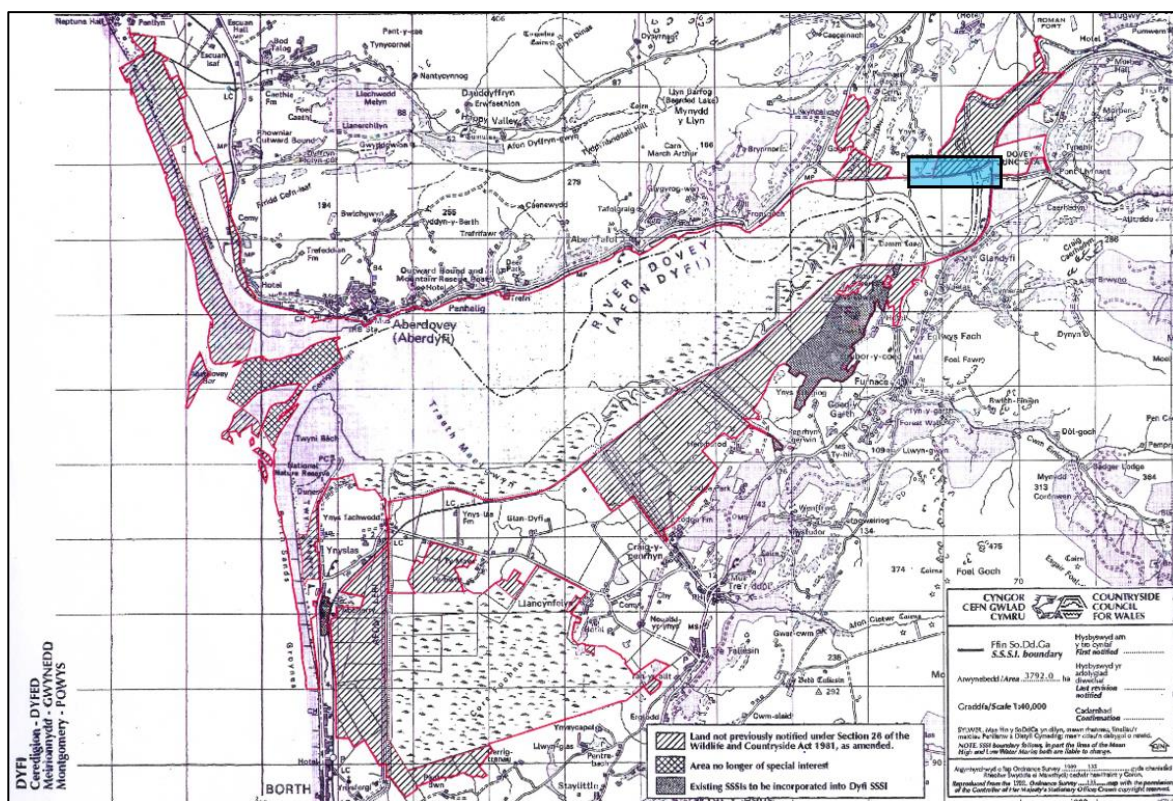


Figure 13: Project in wider context to the SSSI.

- 8.1.1 The Dyfi estuary is designated as a SSSI due to its diverse biological and geological features. It is outstanding for the size, range and the quality of its habitats and their transitions, and for its botanical, entomological and ornithological interest.
- 8.1.2 The estuary of the River Dyfi includes a range of habitats, with river channels and creeks, and extensive areas of sandbanks, mudflats and saltmarsh, including by far the largest area of saltmarsh in Ceredigion.
- 8.1.3 Within the Site Management Statement (SMS), the features below are listed which form the overall status of the designated site:
- | | |
|-------------------------|---|
| ◆ Post-glacial geology | ◆ Otter populations |
| ◆ The Estuary | ◆ Wintering wildfowl populations |
| ◆ Saltmarshes | ◆ Breeding bird assemblage |
| ◆ Sand-dunes | ◆ Reptile assemblage |
| ◆ Estuarine raised bogs | ◆ Invertebrate assemblage of bog/wetland habitats |
| ◆ Lower Plants | ◆ Invertebrate assemblage of dune habitats |
| ◆ Higher Plants | |
- 8.1.4 From the available habitat data and on-site walkovers, the relevant habitat from the SMS in proximity to the project area are:
- ◆ The Estuary
 - ◆ Intertidal mud flats
 - ◆ Salt marsh



- 8.1.5 There is a list of potential damage vectors to the designated site highlighted within the SMS Potentially Damaging Operations (PDO) list. Below are the activities considered relevant to the proposed project (Table 1 below).

Table 2: Potentially Damaging Operations (PDO) list.

SMS Ref No:	Type of operation
21.	Destruction, construction, removal, rerouting, or regrading of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, including soil and rock exposures.
22.	Storage of materials.
23.	Erection of permanent or temporary structures or the undertaking of engineering works, including drilling or the laying, maintenance or removal of pipelines and cables, above or below ground.
24.	Modification of natural or man-made features (including cave entrances) and clearance of boulders, large stones, loose rock or scree and the battering, buttressing or grading of geological exposures.
26.	Use of vehicles or craft.

- 8.1.6 Note: All the above operations occur outside of the designated boundary, with no physical works interacting with the designated or highlighted intertidal habitat above.
- 8.1.7 Mitigation measures for SSSI features which overlap SAC are discussed further in section 13.



9. LLEYN PENINSULA AND THE SARNAU (SAC)

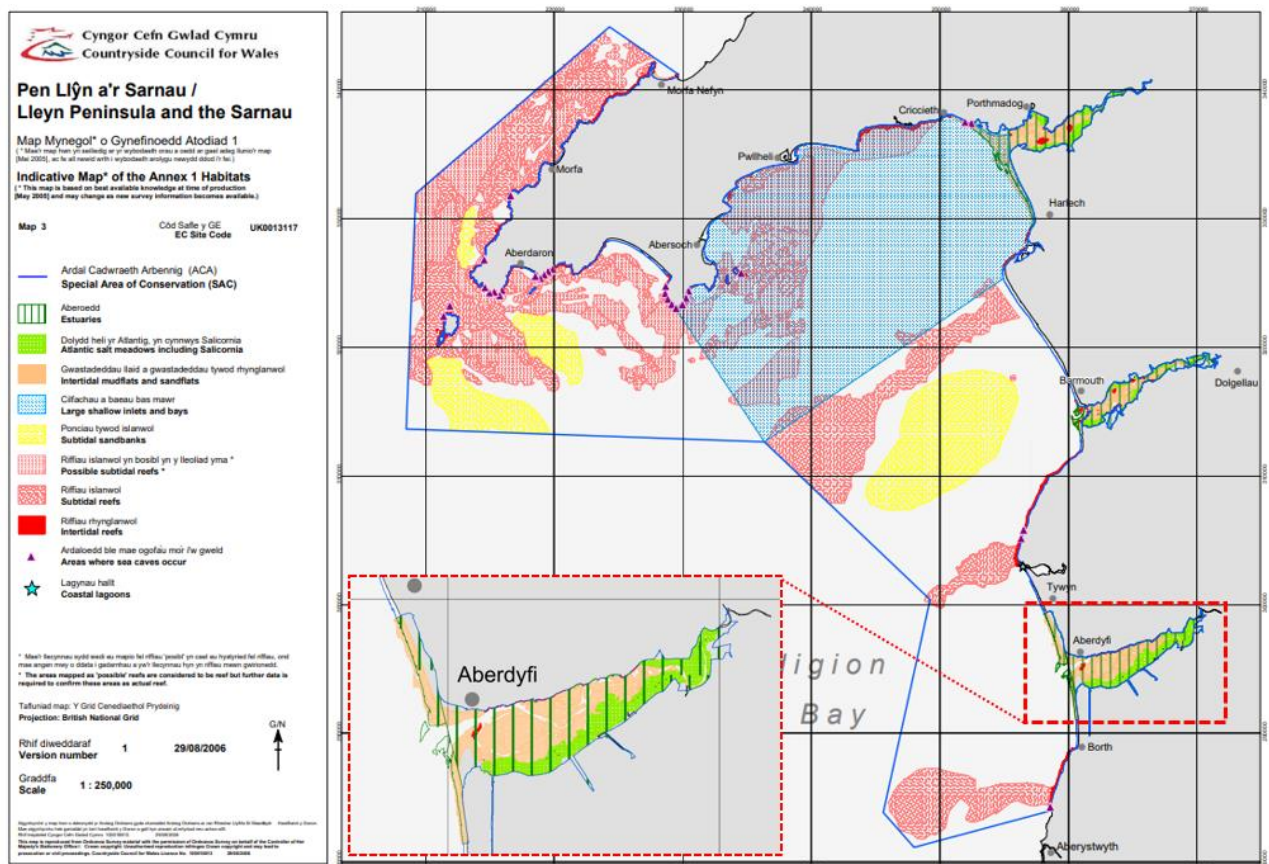
- 9.1.1 The Llyn Peninsula and the Sarnau SAC is comprised of sea, coast and estuary that supports a wide range of marine habitats and dependant wildlife. The nature of the seabed and coast including the range of environmental conditions present vary throughout the SAC. (See figure 3) for project location in relation to the SAC boundary). For the qualifying habitats and species listed in the table below (table 4), the Llyn Peninsula and the Sarnau SAC is one of the best areas in the United Kingdom.

EU Code	Feature
Annex I habitats that are a primary reason for selection of this site	
1110	Sandbanks which are slightly covered by sea water all the time
1130	Estuaries
1150	Coastal lagoons (* Priority feature)
1160	Large shallow inlets and bays
1170	Reefs
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site	
1140	Mudflats and sandflats not covered by seawater at low tide
1310	Salicornia and other annuals colonizing mud and sand
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)
8330	Submerged or partially submerged sea caves
Annex II species present as a qualifying feature, but not a primary reason for site selection	
1349	Bottlenose dolphin (<i>Tursiops truncatus</i>)
1355	Otter (<i>Lutra lutra</i>)
1364	Grey seal (<i>Halichoerus grypus</i>)

- 9.1.2 As the project occurs directly adjacent to the SAC, it is necessary to identify any Annex I & II features that could be impacted.
- 9.1.3 Annex II species will be assumed as these species are highly mobile. The Annex I habitat however are discussed in the following subsections.



9.2 ANNEX I HABITAT ADJACENT PROJECT AREA



9.2.1 Using the available data from the CCW now NRW Designated Habitat Map (Figure 20 above), the relevant Annex I Habitats in relation to the project footprint are:

- ◆ 1130 Estuaries
- ◆ 1140 Mudflats and sandflats not covered by seawater at low tide
- ◆ 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

9.2.2 Again, as previously conceded in this assessment, there are designated habitat features further afield such as large shallow inlets/bays and subtidal sandbanks which would be vulnerable to pollution events, which could impact the Favourable Conservation Status (FCS) of these features. However, as the immediate features to the structure will be protected by robust measures, these further afield features will benefit from the proposed measures in this assessment.



9.3 ANNEX I – NRW INDICATIVE CONDITION REPORT

9.3.1 The tables below are extracted from the PLAS SAC - Indicative site level feature condition assessments 2018, NRW Evidence Report No: 234. These tables describe the current status the Annex I features relevant to the project (Tables 7-10 below).

Table 3: Estuaries Habitat Condition.

Date		May 2017			
Site name		Pen Llŷn a'r Sarnau / Llyn Peninsula and the Sarnau SAC			
Site feature assessed		Estuaries			
Component of habitat feature assessed	Indicative Assessment (Favourable, unfavourable, unknown)	Key evidence type used (Monitoring data, reports or expert judgement)	Level of agreement	Confidence in evidence	Component confidence level
Distribution & Extent (within site)	Unfavourable	Some monitoring data, expert judgement	High	Medium	Medium
Structure & function	Unfavourable	Some monitoring data, WFD waterbody assessments, expert judgement	High	Low	Low
Typical species	Favourable	Some monitoring data, WFD data, expert judgement	High	Medium	Medium
Relevant activities (activities directly impacting condition of the feature on this site)			Historic pollutants Works on Pont Briwet and Dwyrdd Pylon		
Overall Indicative Assessment			Overall Confidence Level		
Unfavourable			Medium		

Table 4: Mudflats and Sandflats Condition.

Date		May 2017			
Site name		Pen Llŷn a'r Sarnau / Llyn Peninsula and the Sarnau SAC			
Site feature assessed		Mudflats & sandflats not covered by seawater at low tide			
Component of habitat feature assessed	Indicative Assessment (Favourable, unfavourable, unknown)	Key evidence type used (Monitoring data, reports or expert judgement)	Level of agreement	Confidence in evidence	Component confidence level
Distribution & Extent (within site)	Unfavourable	Some monitoring data, expert judgement	High	Medium	Medium
Structure & function	Unfavourable	Expert judgement, WFD assessments	Low	Low	Low
Typical species	Favourable	Monitoring data, expert judgement & WFD assessments	High	Medium	Medium
Relevant activities (activities directly impacting condition of the feature on this site)			Development issues Water quality issues		
Overall Indicative Assessment			Overall Confidence Level		
Unfavourable			Medium		



Table 5: Saltmarsh Habitat Condition.

Date		May 2017			
Site name		Pen Llŷn a'r Sarnau / Llyn Peninsula and the Sarnau SAC			
Site feature assessed		Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)			
Component of habitat feature assessed	Indicative Assessment (<i>Favourable, unfavourable, unknown</i>)	Key evidence type used (<i>Monitoring data, reports or expert judgement</i>)	Level of agreement	Confidence in evidence	Component confidence level
Distribution & Extent (within site)	Unfavourable	Expert judgement (knowledge of historical modification to the estuaries), reports, expert judgement based on casework.	High	High	High
Structure & function	Unfavourable	Expert judgement (knowledge of historical modification to the estuaries), WFD assessments, Expert judgement based on casework.	High	High	High
Typical species	Unfavourable	Monitoring data, expert judgement	High	Medium	Medium
Relevant activities (activities directly impacting condition of the feature on this site)			Grazing Infrastructure development: Pont Briwet and Dwyryd Pylon Coastal defence and erosion control		
Overall Indicative Assessment			Overall Confidence Level		
Unfavourable			High		



9.4 ANNEX II SPECIES – NRW INDICATIVE CONDITION REPORT

9.4.1 The tables below are extracted from the PLAS SAC - Indicative site level feature condition assessments 2018, NRW Evidence Report No: 234. These tables describe the current status the Annex II features relevant to the project (Table 6).

Table 6: Otter population condition (Feature overlaps with SSSI).

Date	May 2017				
Site name	Pen Llŷn a'r Sarnau / Lleyen Peninsula and the Sarnau SAC				
Site feature assessed	Otter (<i>Lutra lutra</i>)				
Component of species feature assessed	Indicative Assessment (Favourable, unfavourable, unknown)	Key evidence type used (<i>monitoring data, reports or expert judgement</i>)	Level of agreement	Confidence in evidence	Component confidence level
Population (e.g. size, structure, production, condition of species within site, contaminant burdens)	Favourable	Monitoring data, reports & expert judgement.	High	Medium	Medium
Range (within site)	Unknown	Expert judgement	High	Not applicable	Not applicable
Supporting habitats					
<i>Distribution & extent</i>	Unknown	Expert judgement	High	Low	Low
<i>Structure & function</i>	Unknown	Expert judgement	High	Not applicable	Not applicable
<i>Prey availability and quality</i>	Unknown.	Expert judgement	High	Low	Low
Relevant activities (<i>activities directly impacting condition of the feature on this site</i>)	No activities identified as having a direct impact on site condition.				
Overall Indicative Assessment	Overall Confidence Level				
Favourable	Medium				

9.4.2 Surveys indicate regular otter use of the Glaslyn/Dwyrdd and Dyfi estuaries as well as signs of otters by the Mawddach estuary. Otters living on the coast must have access to freshwater streams and pools for drinking and washing. Otters need to wash in freshwater in order to maintain the insulating properties of their fur. The lack of available freshwater might explain the restricted distribution of otters living along the coast in some areas of the UK, however the SAC is well served with rivers and streams throughout its length.

9.4.3 Habitat essential for otters, i.e. well vegetated stream and river valleys, access to the shore, access to freshwater, secluded resting habitats, is high throughout much of the site. The structural and functional integrity of this essential habitat is considered to be good.

9.4.4 Whilst good quality essential habitat is available within the SAC and adjacent area, the quality and suitability of this habitat can be reduced in a variety of ways, including:

- ◆ the presence and persistence of artificial inert materials (e.g. plastics, synthetic fibres, static fishing gear) leading to entanglement and smothering;
- ◆ decrease in seclusion because of noise and visual disturbance as a result of increased human access, habitation and waterborne activities;
- ◆ the presence and persistence of toxic contaminants, including the risk of fur contamination from oil discharged into freshwater and marine environments;
- ◆ availability and quality of prey.



10. Dyfi RAMSAR & SPA

10.1 SITE OVERVIEW

10.1.1 The Dyfi Estuary is located on the west coast of Wales on the boundary between Ceredigion, Gwynedd and Powys.

10.1.2 The SPA comprises the estuary, with adjoining saltmarsh, marshy grassland and improved grassland. In relation to management plan, the SPA core management plan is representative of RAMSAR objectives also in this specific section of the Dyfi estuary site.



10.1.3 The site is of importance as a traditional wintering area for Greenland White-fronted Goose (*Anser albifrons flavirostris*) – the most southerly regularly used area for this population in the UK. Until the early 1980s the geese roosted on the estuary and flew inland either to the Cambrian mountains or to the raised bog of Cors Fochno to feed. The geese now use the saltmarsh and grasslands for feeding and roost on the sandbanks and mud-flats.

10.1.4 In combination with the multiple designations, the site is of high importance to breeding and wintering wader assemblages.

10.1.5 Within the SPA Core management Plan (CMP), the designated site is split into management sections, to target essential species and habitats that contribute to the site as a whole. The project is situated in management units 1, 7 and 8.1 (see figure 13 below).

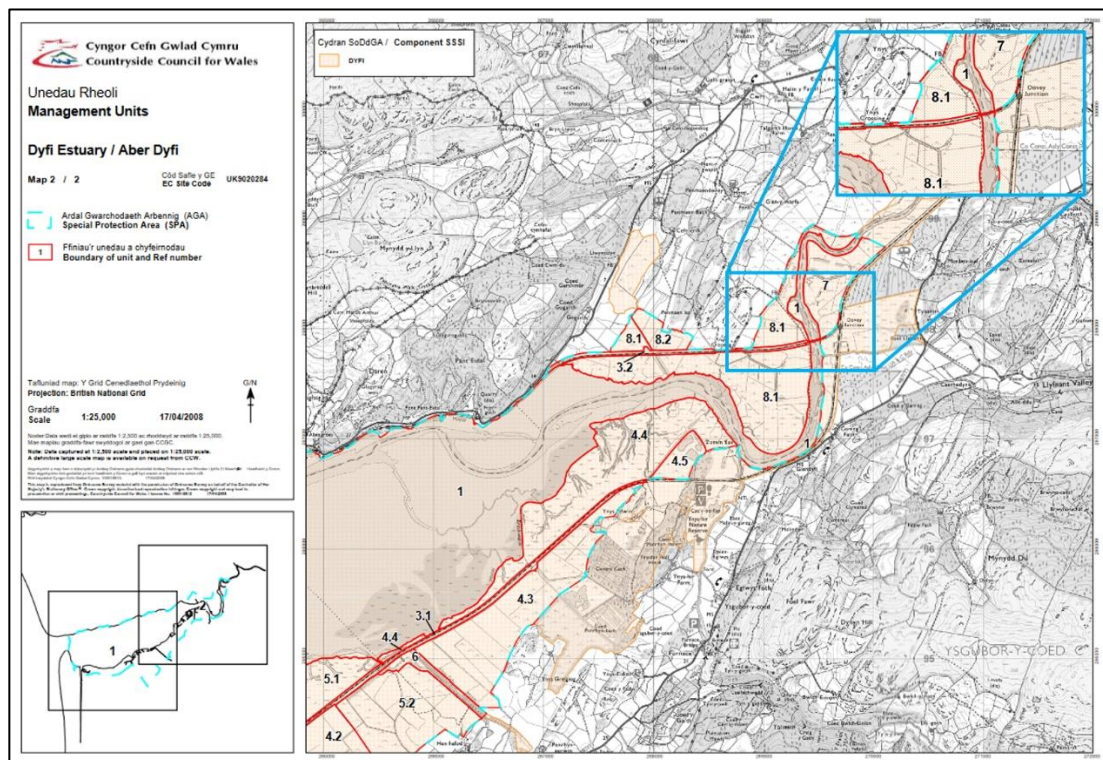


Figure 14: SPA Management Unit.



Table 7: SPA Management Units

Dyfi SPA	Management Unit		
	1	7	8.1
SAC	Yes		
SSSI	Yes		
SPA Feature			
Greenland white-fronted goose	KS	KS	KS
SAC Feature			
Inter-tidal mudflats & sandflats	KH	X	X
Salicornia and other annuals	KH	X	X
Atlantic salt meadow	Sym	KH	KH
SSSI Feature			
Higher plant assemblage	X	Sym	Sym
European wigeon	Sym	Sym	Sym
Breeding waders	Sym	KS	KS
Otters	Sym	Sym	Sym
Invertebrate assemblage	X	Sym	Sym

10.1.6 The table above highlighted the white fronted geese Key Species (KS) status throughout all the management units relevant to the project. The Key Habitats for the management units on site corresponds to the on-site conditions. Inter-tidal mudflat below the structure (management unit 1) and salt marsh habitat to the east and west of the structure (management units 7 & 8.1).

10.1.7 The proposed access route will be situated within management unit 8.1

10.1.8 Regarding the status of Key habitats, please refer back to section 7.3, as the SAC and SPA habitat features overlap.

10.2 SPA KEY FEATURE CONSERVATION STATUS

10.2.1 The current status of the sites key feature is unfavourable.

Table 8: RSPB bird counts (1990-2008).

Year	1990/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
	152	179	134	160	155	142	125	106	167	112
Year	2000/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08		
	134	97	126	116	92	102	90	76		

10.2.2 Consequently the management requirements at within these policy units centres around:

- ◆ maintaining the extent and quality of grazing;
- ◆ ensuring minimum disturbance of feeding and roosting areas.

10.2.3 The mitigations for this project will look to control any potential impact vectors that could be detrimental to the above management objectives.



11. PHYSICAL PROCESSES

11.1 RELEVANT POLICIES WITHIN THE SHORE MANAGEMENT PLAN 2 (SMP2)

- 11.1.1 As part of the appropriate assessment, it is necessary to compare the proposed works against the long term policies outlined within the Shore Management Plan 2 (SMP2). Within the SMP2 there are several policy units relevant to this section of coastline. The structure is contained within Coastal Area D – PDZ10, specifically 10.7 and 10.10.
- 11.1.2 Management units are defined within epochs, with epoch 1 referring to periods from present to 2025, epoch 2 referring to years between 2025-2055 and epoch 3, 2055-2105.

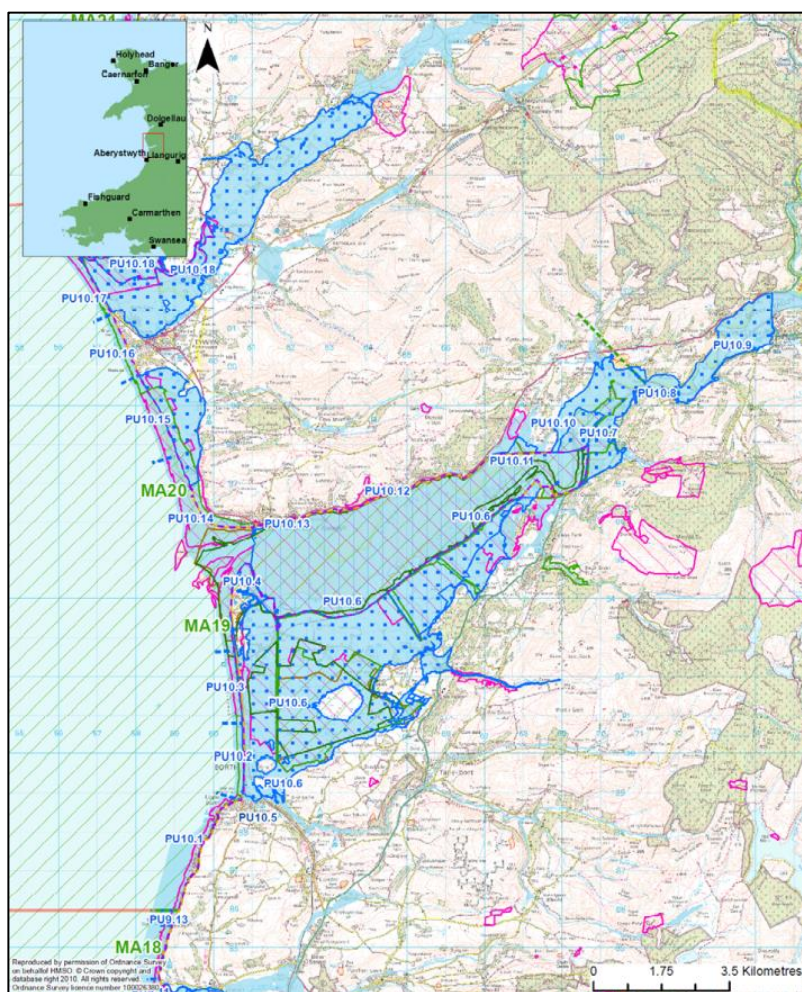


Table 9: SMP2 Relevant policy unit summary.

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
10.07	Pennal Valley	HTL	HTL	MR	With the intent to maintain the transport routes.
10.10	Dyfi Junction	MR	MR	MR	
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					



Table 10: Projected habitat loss during epochs.

Designated Site	Policy Unit	Habitat Type	Extent of Loss of Habitat (ha)			
			Epoch 1	Epoch 2	Epoch 3	Total
PLAS SAC	10.7	Intertidal sandflat	0.87	13.09	No data	13.96
PLAS SAC	10.10	No Data	No data	No data	No data	No data

11.1.3 As a result of the preferred policy there will be a reduction in the intertidal habitat (sandflats) within the boundary of the SAC. There will, however, be no adverse effect on the integrity of the other SAC features.

11.1.4 In regard to coastal squeeze related to this project, as the works are constrained to the bridge structure itself, nor represents an increase in the structure's footprint. The works can be undertaken within the definition of maintenance, recently outlined in the Welsh Government position statement on coastal squeeze relation to infrastructure maintenance.



12. TIMING, FISH SPECIES AND RELATIVE RISK OF HARM/DISTURBANCE

12.1.1 As the project necessitates the working across the span of the upper estuary. It is necessary to compare the proposed working period and likely intensity against the spawning periods of notable fish species present within the designated site.

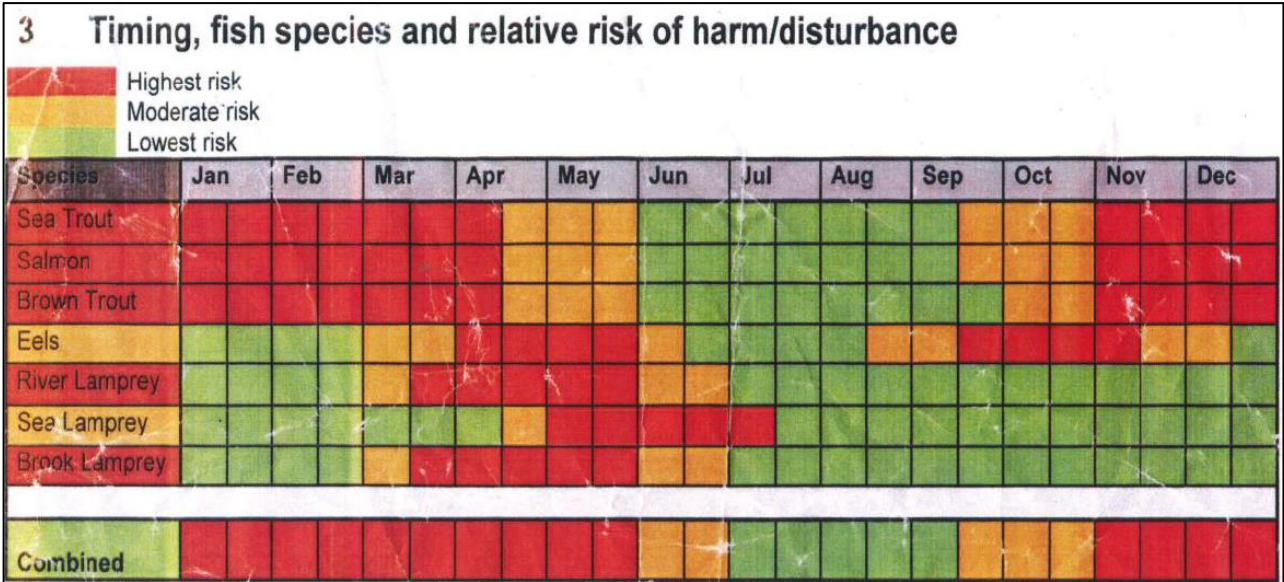


Figure 15: Fish Spawning period chart (provided by NRW during previous works within the PLAS).

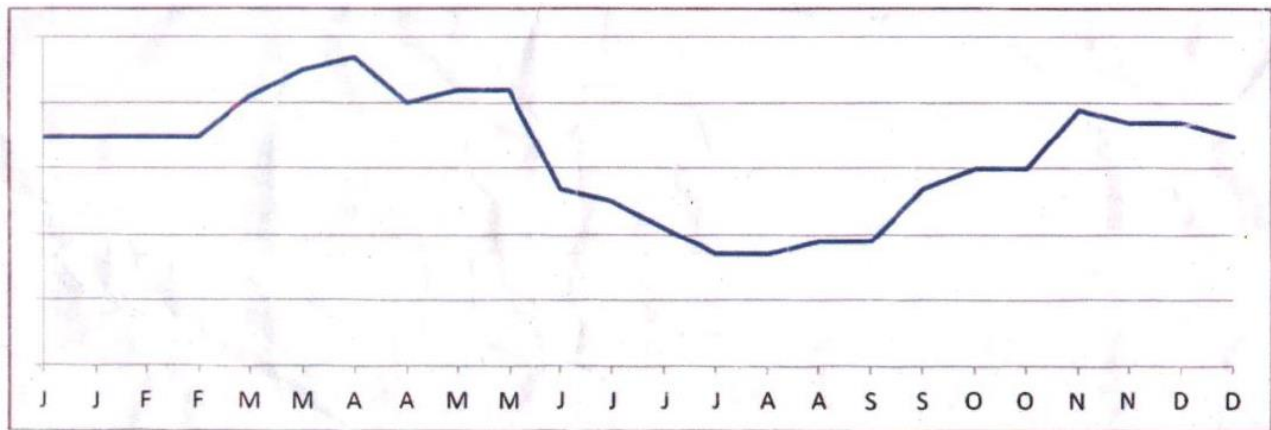


Figure 16: Graphical representation of combined fish sensitivity.

12.1.2 In addition, the Welsh Marine Planning Portal was used to identify any environmental aspects that could be impacted by the works to Dovey Junction Viaduct. The Portal showed that the works area falls within a sole spawning ground.

12.1.3 Impact assessment and mitigations in regard to fish spawning periods and commercial spawning grounds are detailed in the section below.



13. ASSESSMENT OF POTENTIAL IMPACTS RESULTING FROM SPECIFIC ACTIVITIES AND PROPOSED MITIGATION MEASURES – DOVEY JUNCTION VIADUCT REFURBISHMENT

12.2 ANNEX I HABITATS – IMPACTS & MITIGATION

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Annex I habitats: Estuaries. Salt marshes (also part of estuarine habitat). Mudflats and sandflats not covered by seawater at low tide. Habitat outside Designated sites.	SAC/SSSI/SPA/RAMSAR	Loss of habitat from project activities.	The physical works occurring within any of the designated Annex I Habitats that make up any of the sites assemblages will not be permanently removed. Trackway panels are proposed to be used as a form of temporary road surface, which will allow for the retaining of saltmarsh habitat below the road surface. All welfare, storage, parking and general works will occur within either pre-existing Network Road Rail Access Point (RRAP) or within the proposed compound area outside of the protected site. As much equipment and material will be carried along the rail corridor as possible. However, due to the network still being open during the initial phases of the works, the temporary trackway will be essential to prepare the structure for high risk works during the scheduled rail network shut down (blockade). Some excavation work is required around the base of each upright, however all materials will be kept close to the excavation and returned to the original location once the new upright has been spliced to the lower timber components. Each upright will be removed and replaced during a 12-hour period or between tides. A single Mini excavator will be used during this low tide to remove the silt around the base of each upright and allow engineers access to cut the timber using chainsaws.	Negligible likelihood of significant impacts.



Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Annex I habitats: Estuaries. Salt marshes (also part of estuarine habitat). Reefs. Mudflats and sandflats not covered by seawater at low tide. Habitat outside Designated sites.	SAC/SSSI/SPA/RAMSAR	Contamination of the estuary and wider environment from spillage of hydrocarbons during refuelling of plant and equipment or due to equipment failure.	Plant Machinery will only operate within the existing rail corridor and below the structure in the specific locations required. There will be no deviation from temporary access routes. No refuelling of plant machinery or equipment will occur within the estuary habitat. All equipment should be filled and prepared at the compound ahead of a given shift pattern. All items of static plant will be paced within a plant nappy when in use or being stored. Plant will be checked for defects and leaks prior to the start of each shift. Within the compound, a refuelling procedure will be implemented, whereby plant nappies will be placed beneath fuelling apertures during fuelling and refuelling will only be undertaken by designated, trained individuals using equipment specifically designed for that purpose. Network Rail have a spillage plan and specialised contractor in place to respond to and clean up spills. Mitigation has been put in place for the use of this equipment within the project Environmental, Social Management Plan (ESMP). This document has been developed using guidance from: ◆ GPP 2: Above ground oil storage tanks, ◆ GPP 5: Works and maintenance in or near water and ◆ GPP 6: Working at construction and demolition sites, ◆ GPP 7: Safe storage – The safe operation of refuelling facilities, ◆ GPP 21: Pollution incident response planning, ◆ GPP 22: Dealing with spills, ◆ GPP26: Safe storage – drums and intermediate bulk containers. This includes controls for the operation of plant using biodegradable hydraulic oil (where this is within the manufacturers permitted specification), the re-fuelling of plant and equipment, inspection and maintenance routines for plant to identify defects which could result in the release of liquids, biosecurity protocols, silt mitigation procedures, waste management procedures.	Negligible likelihood of impacts with mitigation in place.



			The Contractor will develop and implement an Emergency Awareness and Response Plan. This will describe how spills will be contained and cleaned up. The emergency plan will appoint an Incident Coordinator, define roles and responsibilities during an incident, detail response procedures and contain an inventory of response equipment to be maintained on site.	
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Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
All identified within the project area and proximity.	SAC/SSSI/SPA/RAMSAR	Contamination of the estuary from Grit Blasting and Painting .	Grit Blasting: Grit vacuum blasting and conventional grit blasting will be undertaken using a blend of stone grit and iron silicate grit. This method of blasting contains all blast materials within the nozzle of the blasting gun. Conventional grit blasting may need to be used to reach into corners and sections of profile steel where the vacuum blasting gun cannot reach. The scaffolding around the structure will be fully encapsulated, with a containment deck on working levels. This will be sealed using heavy duty plastic sheeting and the overall scaffold encapsulated using Monoflex sheeting or similar. Grit blasting will result in the release of old paint and rust from the structure. This will be retained within the encapsulation system and removed using industrial vacuum cleaners.	Negligible likelihood of impacts with mitigation in place.



			Application of Paint Systems: The paint system used will be Jotun Marathon 550 or similar approved and will be applied using predominantly spray painting but also brush painting. The paint system if released into the environment by accident is noted for its potential to be "Very toxic to aquatic life with long lasting effects." Consequently, control on how the system is applied is essential. <table><tr><th>Substrate temperature</th><th>5 °C</th><th>10 °C</th><th>15 °C</th><th>23 °C</th><th>40 °C</th></tr><tr><td>Surface (touch) dry</td><td>15 h</td><td>11 h</td><td>9 h</td><td>4 h</td><td>1.5 h</td></tr><tr><td>Walk-on-dry</td><td>26 h</td><td>18 h</td><td>14 h</td><td>8 h</td><td>3 h</td></tr><tr><td>Dry to over coat, minimum</td><td>26 h</td><td>18 h</td><td>14 h</td><td>8 h</td><td>3 h</td></tr><tr><td>Dried/cured for service</td><td>14 d</td><td>10 d</td><td>10 d</td><td>7 d</td><td>3 d</td></tr></table> Within the technical sheet extract above, the curing rate, will require the paint system to be applied at earliest opportunity as the tide recedes, allowing for the recommended curing times to be achieved. As the works are occurring during the spring/early summer, is it highly likely that the paint will have cured to a level that would be unlikely to leach its toxic properties readily into the environment (e.g., dry to the touch). Additionally, painting won't occur during high winds as to avoid drift and unnecessary loss of paint into the environment. Furthermore, visual inspection of the paint system as the tide gradually covers the recently painted areas will be required, with photographic evidence taken and reported to the project environmental clerk of works. This process will also be required to support the quality management system for the project and demonstrate correct application of the paint system.	Substrate temperature	5 °C	10 °C	15 °C	23 °C	40 °C	Surface (touch) dry	15 h	11 h	9 h	4 h	1.5 h	Walk-on-dry	26 h	18 h	14 h	8 h	3 h	Dry to over coat, minimum	26 h	18 h	14 h	8 h	3 h	Dried/cured for service	14 d	10 d	10 d	7 d	3 d	
Substrate temperature	5 °C	10 °C	15 °C	23 °C	40 °C																													
Surface (touch) dry	15 h	11 h	9 h	4 h	1.5 h																													
Walk-on-dry	26 h	18 h	14 h	8 h	3 h																													
Dry to over coat, minimum	26 h	18 h	14 h	8 h	3 h																													
Dried/cured for service	14 d	10 d	10 d	7 d	3 d																													





All identified within the project area and proximity.	SAC/SSSI/SPA/RAMSAR	Release or spread of INNS into the estuary	All machines will undergo biosecurity control measures before entering the estuarine environment. Please see attached Biosecurity Management Plan in Appendix D.	Negligible likelihood of impacts with mitigation in place.
All receptors within estuary environment.	SAC/SSSI/SPA/RAMSAR	Contamination of the estuary from spillage and increased sediment loading.	Works will be undertaken at low tide and hence these will not be immediately released into the estuary but there is some potential for incoming tides to wash out small volumes of mobilised sediment. To quantify this, it is likely that works will be undertaken on a maximum of two piers per tidal cycle using two teams of operatives. The footprint of each work site will be approximately 2m².	Negligible likelihood of impacts with mitigation in place.



12.3 ANNEX II SPECIES – IMPACTS & MITIGATION

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Aggregations of non-breeding birds such as Red Shank & Snipe	SSSI	Noise disturbance / Visual Disturbance / Habitat Destruction.	Project activities will create a source of light and noise over 6-10 hours during the day. Times will vary due to the variation in the tide. As working hours are not continuous there will be periods where birds are not disturbed by site activities. However, it is likely that local bird populations are habituated to a level of disturbance from human activities, due to large numbers of pedestrians walking across the viaduct and trains crossing the viaduct. The Saltmarsh habitat adjacent to the access route / compound is heavily grazed and thus does not provide an abundance of nesting locations. Consequently, the project is unlikely to impact these species nesting sites.	Negligible likelihood of impacts with mitigation in place.
Individual wintering birds	SSSI	Noise disturbance / Visual Disturbance / Habitat Destruction.	Works are set to be completed before the essential winter bird period. Regarding White Fronted Goose, it will be essential to complete the main portion of the works before the end of October 2022. Demobilisation works may continue after this date, however these will occur during daytime hours only and noise output can be better controlled / monitored.	Impact Not Likely to be Significant
Potential Bat species	SAC & SSSI Bat Sites	Noise disturbance / Visual Disturbance / Habitat Destruction.	No trees require removal for the project to take place. Site lighting will be limited to lighting of safety critical areas and task lighting Other lighting will be PIR activated and will hence operate for short durations only. Task lighting will be low level flat glass LED luminaires and will be focused onto the task area, with minimal light spill. The structure will be assessed for bats and an activity survey undertaken during June/July. Should a roost be found within the structure and an EPS License will be applied for.	Impact Not Likely to be Significant, with appropriate mitigation.



Otters	SAC & SSSI	Noise disturbance / Visual Disturbance / Habitat Destruction.	Toolbox Talks will inform site personnel on identifying the Annex II Species. No otter holts have been noted to date within proximity to the structure and access route. The project does not represent a hard boundary preventing access to the wider estuary by this species. Habitat pertaining to Otters being impact is limit, however there may be a temporary impact to prey species disturbed by ongoing works. It is not anticipated that these works will have an impact on the population. Additionally, no equipment or excavation will be left in such a manner that during high tide an animal could become snared and trapped within the working area. Should an Otter be encountered during works, personnel will temporarily stand down until the animal has vacated the immediate area under its own volition. The contractor will abide by the Gwynedd Marine Code of Conduct. Salmon, which are a prey of Otter will not be prevented from travelling up the estuary during the project. Although there will be an elevated human presence around the structure, it is unlikely that this will present an impassable barrier to salmon migrating to spawn. Directional lighting measures as with those proposed for bat species will be implemented for Otter population to limit disturbance. Task specific lighting will be used and the use of flood lights will be avoided. Vehicles will be loaded during the day as often as possible to reduce overall night time disturbance. Steps will be undertaken to ensure that otters, mammals and birds do not become trapped within working and storage areas. This will take the form of compound barriers reaching ground level and attachments to gates to prevent access by otters or other mammals such as badgers from entering the compounds. 24hr working is projected to be limited to only the rail blockade in 2022. Night shifts will generally be limited to a Saturday nights. These works will only take	Impact Not Likely to be Significant, with appropriate mitigation
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			place from the structure itself and will not feature machine access to the estuary during low tide. Pre-works Otter recording will be taken during the month of June/July to inform the projects methodology and undertake a thorough check for potential holts within the impact radius of the works. Should an Otter holt be found near the works footprint, then an EPS License will be discussed with NRW. Any unfinished excavations within the estuary will be backfilled to prevent entrapment.	
Fish Assemblage	SAC/SSSI	Noise disturbance / Visual Disturbance / Habitat Destruction.	The majority of the works within the designated will be undertaken mostly outside of the fish spawning season for migratory fish such as salmon, trout and eel (mid Oct – Mid April) but will fall within the spawning season for several species of fish which are offered protection under the Natural Environment and Rural Communities Act. Spawning periods for these species are generally between March and July. No works within the designated sites will occur until formal assent as been granted by Natural Resources Wales. Works will be undertaken within the estuary during the 2022 early winter spawning season for protected and migratory fish. Mitigation of impacts from these works will be difficult but the largest mitigating factors are: ♦ Works within the estuary during low tide at bed level will be localised and low impact and will not involve deep excavation or dredging. No increase in structure footprint is envisaged. ♦ The viaduct is currently used by trains. This implies that fish within the estuary are habituated to noise and vibration from the structure. Noise and vibration during the works will be of a greater magnitude and longer duration, particularly during the blockades. ♦ Complete mitigation of these impacts will be difficult but best practice will be used in terms of the construction methodology to limit this i.e. no site radios, modern well silenced plant.	Impact Not Likely to be Significant, with appropriate mitigation



			◆ Night works are likely during rail blockades. Task lighting will be designed to illuminate the works area but limit light spill into the estuary. This will be achieved through the use of LED flat glass luminaires set at a low level to the viaduct. ◆ Any unfinished excavations along the estuary edge will be backfilled to prevent entrapment.	
Commercial Fishing		Noise disturbance / Visual Disturbance / Habitat Destruction.	The works will avoid working within the marine environment as much as possible. The majority of the works will take place on the structure itself, either from rail level or from temporary scaffolding erected to the structure only. The only works that interact with the water environment are the pile replacements. These will be undertaken by a dive team and use a specialist chain saw. There will be no disturbance to the riverbed from the use of heavy plant or piling rigs.	Impact Not Likely to be Significant, with appropriate mitigation



14. POTENTIAL IN-COMBINATION EFFECTS

13.1 OVERVIEW

- 13.1.1 It is necessary to consider the potential for significant effects from this project in-combination with other plans or projects.
- 13.1.2 In addition, the plan or project must have been subject to a HRA, which has confirmed that the plan or project is not likely to have a significant effect or demonstrates that the effects have been sufficiently assessed so as to be reasonably understood.
- 13.1.3 The assessment of in-combination effects must also focus on other projects that have the potential to cause the same types of effects as the proposed maintenance (so that these effects may occur in-combination) and where similar potential impact pathways may exist.
- 13.1.4 Therefore, this assessment has focused on other projects that could give rise to noise, visual or physical impacts on the SAC species and does not consider projects that could cause different effects.

15. KNOWN PROJECTS WITHIN THE WIDER AREA

- 14.1.1 There is no known other large-scale project within proximity to Dovey Junction Viaduct No.1 project.



16. HRA CONCLUSION

- 14.1.2 This section will combine the key features and challenges highlighted in the (Core Management Plan) CMP's with the proposed activities to ascertain whether likely significant impacts to the designated site could occur.
- 14.1.3 Encountering Annex II species during the project is a possibility, however it is likely that these occurrences will be relatively infrequent.
- 14.1.4 As the project is project to last a little over 5 months in duration with a commitment to only day working unless necessary to work around train timetables, there will be a limited period continuous disturbance over the project as a whole during the full rail blockage.
- 14.1.5 The overall footprint of the project is relatively low, and the footprint of the structure will not be increased as a result of the works.
- 14.1.6 The scaffolding crash deck will have a minimum percentage increase in overall footprint, combined with the limited period it will be erected, it is assessed those changes to localised physical process will be negligible. The scaffolding will be secured to the existing structure in such a way as to be high resistant tp potential unforeseen high energy events.
- 14.1.7 Pollution control measures and emergency response plans will allow for robust controls over hydrocarbon pollution events, which are unlikely. These are further detailed in the attached Construction Plan, which references GPP supporting documentation.
- 14.1.8 Fish species are also unlikely to be heavily impacted with the limited scale of the works in relation to spawning periods, combined with the duration of the works falling largely outside a significant portion of most sensitive species spawning periods. At no point will the permanently flowing portion of the estuary be impeded.
- 14.1.9 Regarding long term SMP2 policy and Coastal Squeeze. As the project concerns only the timber and metallic portions of the bridge structure, there will be no contribution to coastal squeeze as a result of the replacement of this structure.
- 14.1.10 Mobilisation of sediment is likely to be limited as a result of only a two uprights requiring excavation along the bank edge.
- 14.1.11 Control of INNS is ensured using the Biosecurity Risk Assessment Plan and Management Plan. Visual identification of this invasive species will be disseminated to personal working on the structure and a pre-works inspection of all existing components will be undertaken.
- 14.1.12 The Biosecurity measures in place at the compound will make sure that all equipment and vehicles delivered to site have been cleaned and disinfected prior to deployment into the SAC/SSSI environment. This forms part of the guidance outlined in the Appendix A.
- 14.1.13 The location of the works in relation to otters in unlikely to impact overall habitat availability, given the proximity to the Afon Einion, Afon Pennal, riparian habitat confluences is significant. The Afon Llyfnant confluence is the closest to the project, downstream of the bridge. This will also be monitored during the pre-works field camera surveys.
- 14.1.14 Compound lighting control and robust compound fencing will lower disturbance to species such as otter and bats.



- 14.1.15 The timing of the project is outside of the peak wintering wader season. Consequently, impacts to the vulnerable populations of Greenland White Fronted Goose is considered unlikely.
- 14.1.16 From the available information, it is not evident that the Annex I Habitat & Annex II Species that compromise the designate sites overall, will be significantly impacted during the proposed replacement. There will be a temporary elevation in noise and visual pollution vectors during the project, for a short period of time.
- 14.1.17 Viewing the overall scope of this project, this assessment suggests that Likely Significant Impacts the PLAS SAC, Dyfi SSSI, SPA and Cors Fochno & Dyfi RAMSAR is unlikely



17. APPENDIX A – BIO-SECURITY PLAN

