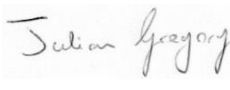


2022

**Sudbrook RA2140 – Defence
Maintenance
Habitat Regulations Assessment (HRA)**



DOCUMENT INFORMATION			
Project	Sudbrook RA2140 – Defence Maintenance		
Location	Address: Sudbrook Pump House, Old School Mews, Portskewett, Sudbrook, Monmouthshire, NP26 5SY Grid Ref: ST 50820 87490 to ST 50697 87307		
Title	Habitat Regulations Assessment		
Document Ref	EV000924/HRA-1	Issue / Revision	1
File reference	EV000924/3/HRA-1		
Start Date	08/2022		
	Name	Signature	Date
Assessment Undertaken by	Owain Waters		8/2022
Document prepared by	Owain Waters		8/2022
Checked by	Julian Gregory		8/2022
Authorised by	Julian Gregory		8/2022

DOCUMENT CONTROL		
Rev.	Date	Description
0	08/22	Draft
1	08/2	Issued

Disclaimer

No part of this document may be copied or reproduced by any means without prior written permission from EcoVigour. If you have received this report in error, please destroy all copies in your possession or control.

This document has been prepared for the exclusive use of the commissioning party/parties and unless otherwise agreed in writing by EcoVigour, no other party may use, make use of, or rely on the contents of the report.

No liability is accepted by EcoVigour for any use of this document, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in the document are on the basis of EcoVigour using due skill, care and diligence in the preparation of the same and no explicit warranty is provided as to their accuracy.



CONTENTS

1. Introduction	4
1.1 Assessment Background	4
1.2 Project Background	5
2. Legislative Context	6
2.1 Overview	6
3. Methodology	6
3.1 Overview	6
4. Description of The Proposed Activities	7
4.1 Site Context	7
4.2 Method Overview – Masonary Wall Repairs and Embankment Mainteance	8
4.3 Supporting Works	10
4.4 Site Images and Figures	11
5. HRA Methodology Objectives	14
6. Designated Sites within Proximity to Site	15
7. The Severn Estuary European Protected Sites	16
7.1 Available Data	16
8. High Tide Roosts in Relation to Project	17
8.1 Designated Roosts	17
9. Severn Estuary SSSI	18
9.1 OVERVIEW	18
9.2 Site Management Statement	19
9.3 Habitat Present within Working Footprint	20
10. Physical Processes	21
10.1 Relevant Policies within the Shore Management Plant 2 (SMP2)	21
11. Assessment of Potential Impacts Resulting from Specific Activities and Proposed Mitigation Measures – Sudbrook Defences	23
11.1 Annex I Habitats – Impacts & Mitigation	23
11.2 Annex II Species – Impacts & Mitigation	26
12. Potential In-Combination Effects	30
12.1 Overview	30
13. Known Projects Within The Wider Area	30
14. HRA Conclusion	31
15. Appendix A - Biosecurity Management Plan & Risk Assessment	32
16. Appendix B- Project Technical Documents	33



FIGURES

Figure 1: Project Location.	5
Figure 2: Sudbrook pier facing south at the defences downstream protecting the pumping station.	5
Figure 3: Sea Defence Sections.	7
Figure 4: 9 tonne plant machine.	10
Figure 5: Proposed Access Routes and location of equipment delivery.	11
Figure 6: Rock armour along the southern portion of the defence line, below a small public park.	11
Figure 7: Tiered masonry and concrete cast wall defence, with masonry embankment above.	12
Figure 8: Significant scour failure below masonry toe of the structure further north.	12
Figure 9: Headwall and wingwalls of Sudbrook tidal flap.	13
Figure 10: Dwarf wall directing the flow of water from the tidal flap.	13
Figure 11: Designated Sites in proximity to Sudbrook Defences.	15
Figure 12: Roosts Slimbridge Area.	17
Figure 13: SSSI Designated Site boundary in relation to project area (blue overlay).	18
Figure 14: Habitat in proximity to Sudbrook.	20
Figure 15: SMP2 - Policy Units	21

TABLES

Table 1: Description of bird species making up the RAMSAR/SSSI composition of the Severn Estuary. (Red- Nationally important numbers, Blue – Internationally important numbers, Yellow – Annex 1 species).	16
Table 2: PDO list from NRW Designated Site Finder Tool.	19
Table 3: Relevant Policy Unit description.	21



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') for scheduled maintenance of the Sudbrook Sea Defences on behalf of Network Rail (NR).
- 1.1.2 The project is part of the larger RA2140 Coastal, Estuarine and River Defences (CERD's) package of works, which are comprised of multiple defence asset repairs along the British coastline. Sudbrook is comprised of two works packages, which will be undertaken within the same Marine License area, as the works concern the same defence in essence. These packages of works are RA2140 - 2026 and RA2140 – 2027.
- 1.1.3 EcoVigour Ltd have been commissioned to produce these documents for Dyer & Butler Ltd (Rail Division), the principal contractor, working on behalf of Network Rail, the client and asset owner.
- 1.1.4 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'.
- 1.1.5 The project is scheduled to begin at the earliest opportunity upon receipt of the Marine License. Estimated to occur between October 2022 to October 2023. The works will take several months over the next year to complete the masonry repairs, vegetation clearance, asset inspection reporting and repairs to significant scour failures which threaten to cause a failure of the defence. No rock armour replenishment is envisaged as part of these works.
- 1.1.6 In addition to serving the Appropriate Assessment (AA) requirements, this document will also serve notice of activities in proximity to a SSSI (S28G Notice). This assessment will be submitted to the competent authority Natural Resources Wales (NRW) due to the defences marking the legislative boundary of the adjacent designated sites.
- 1.1.7 As the works necessitate repairs in places seaward of Mean High-Water Spring (MHWS) limits of the Severn Estuary and use of a 9T plant machinery along the foreshore below the defences, a Band 2 License is required.
- 1.1.8 The main statutory designated site which requires consideration under the Habitats Regulations has been identified as:
 - ◆ Severn Estuary, Special Area of Conservation (SAC), Special Protection Area (SPA) & RAMSAR Site.
- 1.1.9 Also requiring consideration in relation to seeking Site of Special Scientific Interest (SSSI) Assent for the works from NRW is:
 - ◆ Severn Estuary Site of Special Scientific Interest (SSSI).
- 1.1.10 Following review and consensus, this document will form part of the working methodology for the project, supporting working within a designated site.
- 1.1.11 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 The Sea Defences are located along the western shore of the Severn Estuary, several hundred meters north of the new Severn Road crossing. The defence asset protects the Severn Rail tunnel pump house and tidal flap structure, which serve to maintain the tunnels water levels. The asset is a mixture of rock armour, solid concrete embankments and masonry wall sections built in tiers.
- 1.2.2 The asset exhibits significant scour failures, masonry defects and vegetation ingress into upper sections which require remedial measures at the earliest opportunity. The latest Network Rail asset report has deemed the asset to be in a poor operational condition.

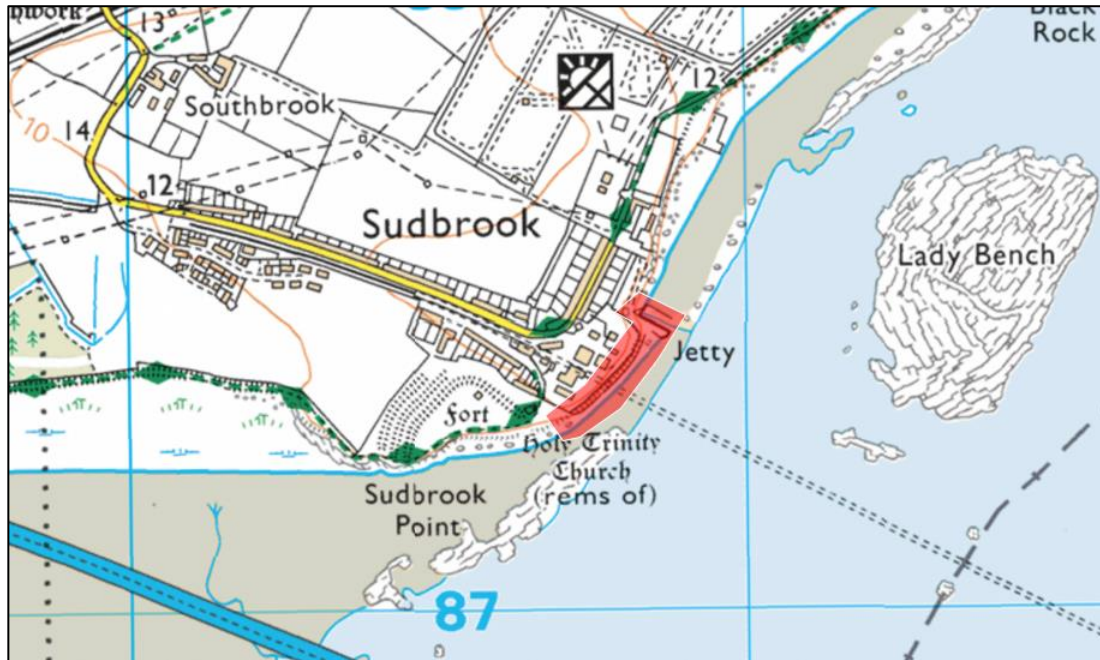


Figure 1: Project Location.



Figure 2: Sudbrook pier facing south at the defences downstream protecting the pumping station.



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 (Dyer & Butler) on behalf of Network Rail.
- 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 The asset is situated along the shore of the Severn Estuary and in areas demarcates the boundary of the SPA, SAC, SSSI and RAMSAR site boundaries of the site.
- 3.1.3 Additionally, there are several SSSI's and a further SAC within close proximity to the project which will be discussed in further detail within the scoping section below.
- 3.1.4 This HRA will focus on the potential likely significant effects (LSE) of the asset maintenance on the Severn Estuary, Special Area of Conservation (SAC), Special Protection Area (SPA) & RAMSAR Site.



4. DESCRIPTION OF THE PROPOSED ACTIVITIES

4.1 SITE CONTEXT

- 4.1.1 The work site focuses on the areas of wall masonry, concrete embankment and toe beams which have collapsed into scour failures. Access to the defences is provided by existing steps through the pumping station to the rear of the wall and along an access path which passes behind the wall to the north of the tidal flap. This route will be used to allow for a 9t tracked excavator to access the foreshore (see access route figure in the sections below).
- 4.1.2 Boulders have been placed previously to block unauthorised machine access to the foreshore. These will be removed temporarily to allow for project access and will be reinstated at the end of the project or when the plant machine is off hired.



Figure 3: Sea Defence Sections.

- 4.1.3 The attached Appendix highlights the scope of works required at the site, full NR Asset Report and Works Plan.
- 4.1.4 The works remit from that scope will be limited to the agreements within this Marine License. More complex works such as rock armour replenishment or whole replacement of the defence asset would require an amended marine license.
- 4.1.5 The maintenance works will consist of the summarised tasks described in the section below:
- ◆ Masonry Repairs
 - ◆ Vegetation Clearance
 - ◆ Follow up visual inspection and scoping
 - ◆ Repairs of a minor nature (e.g., reseating loose embankment material by hand)
 - ◆ Reinstatement or replacement of failed toe beams which have resulted in scour failures.



4.2 METHOD OVERVIEW – MASONARY WALL REPAIRS, EMBANKMENT MAINTENANCE AND SCOUR REPAIRS

- 4.2.1 Works are scheduled to commence October 2022 for approximately 12 months in duration. Works will occur over several weeks and will not be undertaken constantly during the requested license period. The longer license period is requested to account for poor weather conditions and limited available light during low tide conditions towards the winter months, as the determination of the license will likely take until autumn.
- 4.2.2 Works periods will be scheduled around daytime shifts primarily as to ensure safer working conditions and reduced disturbance to local residential areas and the wider environment.
- 4.2.3 Maintenance to the sea walls during the night is not envisaged, however some works or demobilisation on a given day may occur close to dusk. Should emergency working be required to shore up a failure, within the license conditions, then night working may occur to ensure actions are taken in a timely manner to ensure the integrity of the asset.
- 4.2.4 The project works will be monitored by an Environmental Clerk of Works (ECoW) to ensure abidance to the HRA conditions, undertaking supervision duties when required and undertaking audits. The ECoW has the authority to instruct site operations to cease in the event works are causing disturbance to bird species. E.g., during sensitive early morning foraging periods. It is assessed this is unlikely given the works distance from high tide roosts, however the ECoW and site team will remain diligent regarding waders foraging at low tide.
- 4.2.5 Rope access system will be setup in accordance with Specialist Subcontractor RAMS and operatives will access the wall from the top down to the required location of the repair along the sea wall / embankments where required (dependent on slope angle and height).
- 4.2.6 Mixing equipment will consist of a 110v paddle mixer, 3.5kVa generator and mixing buckets. The pieces of equipment can be moved by hand when required.
- 4.2.7 Localised clearance of vegetation growing from some areas of the sea wall will be removed where necessary to access the wall or prevent root systems from causing further internal damage to the walls structure.
- 4.2.8 Repointing materials will be mixed in accordance with manufacturer's instructions. Where possible, mixing of material will occur on stable sections of the defence asset. However, some mixing may need to occur at beach level. Where safe, tarp will be laid down in such events to contain potential mixing overspill.
- 4.2.9 PIC (Person in Charge) indicates rope access operatives or engineers may begin work when the tidal conditions allow access to the base of the defences (non-high tide times).
- 4.2.10 Operatives will place polythene protection to base of sea wall/embankments at the areas of works, in order to capture any arisings from the maintenance. Existing loose mortar will be removed using hand tools and collected where possible.
- 4.2.11 Operatives will document each section of works, on completion of pointing rope access operatives collect dropped pointing materials and remove from the working area.



- 4.2.12 The use of the 9t plant machine will be limited to the scour failure of the toe beams and other scour failures below walls, seen in the NR Asset Report (Appendix B) and figure 8 below. Repairs to the toe beams require the machine to assist in clearing out those defects, to allow for a temporary shroud to be installed ahead of casting of new concrete toe beams.
- 4.2.13 The machine will also carry heavy material such as block stone to fit into the voids caused by scour. The repair will be like for like and will not increase the footprint of the defence asset. Any new toe beam will be a replacement of completely failed toes that cannot be reinstated and will match the profile of the remaining beams to ensure the structure is repaired like for like.
- 4.2.14 For the larger voids, a mixing wagon will be situated within the Sudbrook compound area and will pump concrete material to the failures via a pumping line. Any excess material will be collected by the plant machine based on the foreshore to avoid overspill remaining in the marine environment.
- 4.2.15 Regarding the upper masonry/concrete embankment, vegetation growth will require removal to better ascertain the condition of these areas and implement repair.
- 4.2.16 Loose mortar material will be moved by hand and set into position using target use of mortar or securing pins. Any other minor repairs, such as handrail replacement, will be on a like for like basis.
- 4.2.17 Vegetation clearance will only occur on the sea defences and within 30cm from the toe of the defence as to not impact the adjacent designate habitat features. There will be no removal of Annex I habitat from the designated sites.
- 4.2.18 All clearance will be undertaken with hand tools, with no mechanical clearance.



4.3 SUPPORTING WORKS

Site Welfare - Delivery/Setup

- 4.3.1 No formal compound is required to support the works. Welfare will be provided using mobile welfare vans or groundhog cabins (mobile welfare units) delivered to the Sudbrook compound. Welfare vans and other support vehicles will be moved to suitable locations as the project requires.
- 4.3.2 Space allowing, these vans will be predominately situated within the Sudbrook pumping station compound. This will also be the location for material delivery and setting up of the concrete wagon and pumping apparatus.

Vehicle Access

- 4.3.3 The single 9 tonne excavator will be the only heavy machine permitted for use during this project.
- 4.3.4 In terms of agreed routes, the plant machine will be delivered to site by road and offloaded within the new housing development. The machine will utilise the existing pathway that connects the housing estate to the rear of the sea wall.
- 4.3.5 The boulder barriers will temporarily be relocated to allow for the machine to access the lower beach area. These barriers do not serve a defence purpose.
- 4.3.6 The machine will only be permitted to travel on the foreshore, mud, sand and shingle habitat. At no point will the machine be permitted to travel over vegetated intertidal habitat such as Saltmarsh.



Figure 4: 9 tonne plant machine.

Emergency Plans

- 4.3.7 The contractor will ensure that emergency pollution control plans above standardised spill control plans are prepared prior to the commencement of the project. The contractor will ensure a plan on vehicle extraction from the in-channel environment is available with plant machines or equipment on site capable of retrieving a stranded machine.

Emergency Plan Fundamentals:

- ◆ Any disabled machine within the channel environment will be immediately checked for any potential release of hydrocarbons, and if discovered, spill kits and trays will be used immediately.
- ◆ The on-call emergency plant engineer provider will be requested to attend site in the event that the fault cannot be resolved by the operator.
- ◆ Should the on-call engineer be unable to repair the machine, then it should be attempted to extract the machine using a similar powered machine, using task specific chains or tethers to tow the vehicle to a safe position.
- ◆ Should this fail, then the contractor must drain the machine of all fuel and hydraulic fluid before the tidal waters encroach on the machine. NRW and the on-call Environmental Clerk of Works will be contacted immediately and made aware of the emergency and risk of a pollution event. NRW employ specialist contractors for this.



4.4 SITE IMAGES AND FIGURES

- 4.4.1 The figures below illustrate the sites current condition and the indicative habitat present during summer 2022 in proximity to the Sudbrook defences.



Figure 5: Proposed Access Routes and location of equipment delivery.



Figure 6: Rock armour along the southern portion of the defence line, below a small public park.



Figure 7: Tiered masonry and concrete cast wall defence, with masonry embankment above.



Figure 8: Significant scour failure below masonry toe of the structure further north.



Figure 9: Headwall and wingwalls of Sudbrook tidal flap.



Figure 10: Dwarf wall directing the flow of water from the tidal flap.



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 interfacing or within proximity to the Sea Defences. Directly concerned with the Sea Defences are:
- 6.1.2 Site of Special Scientific Interest:
◆ Severn Estuary (SSSI)
- 6.1.3 Special Area of Conservation:
◆ Severn Estuary (SAC)
- 6.1.4 Special Protection Area (SPA)
◆ Severn Estuary (SPA)
- 6.1.5 RAMSAR's
◆ Severn Estuary - RAMSAR
- 6.1.6 The SSSI contains overlapping features and therefore will be viewed in combination with the SAC in terms of mitigation highlighted in the latter sections within this document.
- 6.1.7 The SAC, SPA and RAMSAR will be detailed within the same sections as the SPA & RAMSAR Ornithological features are reliant on the in-situ features present within the SAC.





7. THE SEVERN ESTUARY EUROPEAN PROTECTED SITES

- 7.1.1 The Severn Estuary European sites are located immediately alongside the Severn Estuary (see Figure 1&2). The estuary is designated as a SAC, SPA and Ramsar site. The estuary intercepts the boundaries of the sea defence most of the site footprint. Assent from Natural Resources Wales with regard to the SSSI designation forms a portion of this appropriate assessment.

Table 1: Description of bird species making up the RAMSAR/SSSI composition of the Severn Estuary. (Red- Nationally important numbers, Blue – Internationally important numbers, Yellow – Annex 1 species).

Common name	Latin name	Reason for selection	Primary habitat
Bewick's Swan	<i>Cygnus columbianus bewickii</i>	Annex 1 species, Internationally important numbers	Coastal grazing marsh, pools
European white-fronted goose	<i>Anser albifrons albifrons</i>	Internationally important numbers	Coastal grazing marsh, sandbanks
Shelduck	<i>Tadorna tadorna</i>	Internationally important numbers	Intertidal mud and sand
Gadwall	<i>Anas strepera</i>	Internationally important numbers	Coastal grazing marsh, pools
Dunlin	<i>Calidris alpina</i>	Internationally important numbers	Intertidal mud and sand
Redshank	<i>Tringa totanus</i>	Internationally important numbers	Intertidal mud and sand, saltmarsh, coastal grazing marsh
Wigeon	<i>Anas penelope</i>	Nationally important numbers	Intertidal mud, saltmarsh, coastal grazing marsh
Teal	<i>Anas creca</i>	Nationally important numbers	Shallow water, pools, coastal grazing marsh
Pintail	<i>Anas acuta</i>	Nationally important numbers	Shallow water, coastal grazing marsh
Pochard	<i>Aythya ferina</i>	Nationally important numbers	Estuary
Tufted duck	<i>Aythya fuligula</i>	Nationally important numbers	Estuary
Ringed plover	<i>Charadrius hiaticula</i>	Nationally important numbers	Intertidal
Grey plover	<i>Pluvialis squatarola</i>	Nationally important numbers	Intertidal, coastal grazing marsh
Curlew	<i>Numenius arquata</i>	Nationally important numbers	Intertidal, coastal grazing marsh
Whimbrel	<i>Numenius phaeopus</i>	Nationally important numbers	Coastal grazing marsh, intertidal
Spotted redshank	<i>Tringa erythropus</i>	Nationally important numbers	Intertidal

7.1 AVAILABLE DATA

- 7.1.2 Data indicates the species within the list below have been recorded within proximity to the Sudbrook Pumping station:
- ◆ Anas Acuta – Pintail
 - ◆ Ana Creca – Teal
 - ◆ Charadrius hiaticula – Ringed plover
 - ◆ Numenius phaeopus – Whimbrel
 - ◆ Tadorna tadorna – Shelduck
 - ◆ Tringa tetanus – Redshank
- 7.1.3 It is likely these species will move past this section of shoreline and forage during low tide. It is difficult to ascertain the number of birds that will pass through this specific corridor as it is further away from larger counting locations.



8. HIGH TIDE ROOSTS IN RELATION TO PROJECT

8.1 DESIGNATED ROOSTS

- 8.1.1 High tide roosts are present on both shores, north, south and east of Sudbrook. The shape file data was acquired from the NRW and NE data portals and transposed on to the figure below. A maximum impact buffer of 2km has been overlayed to illustrate the projects proximity to these roosts.

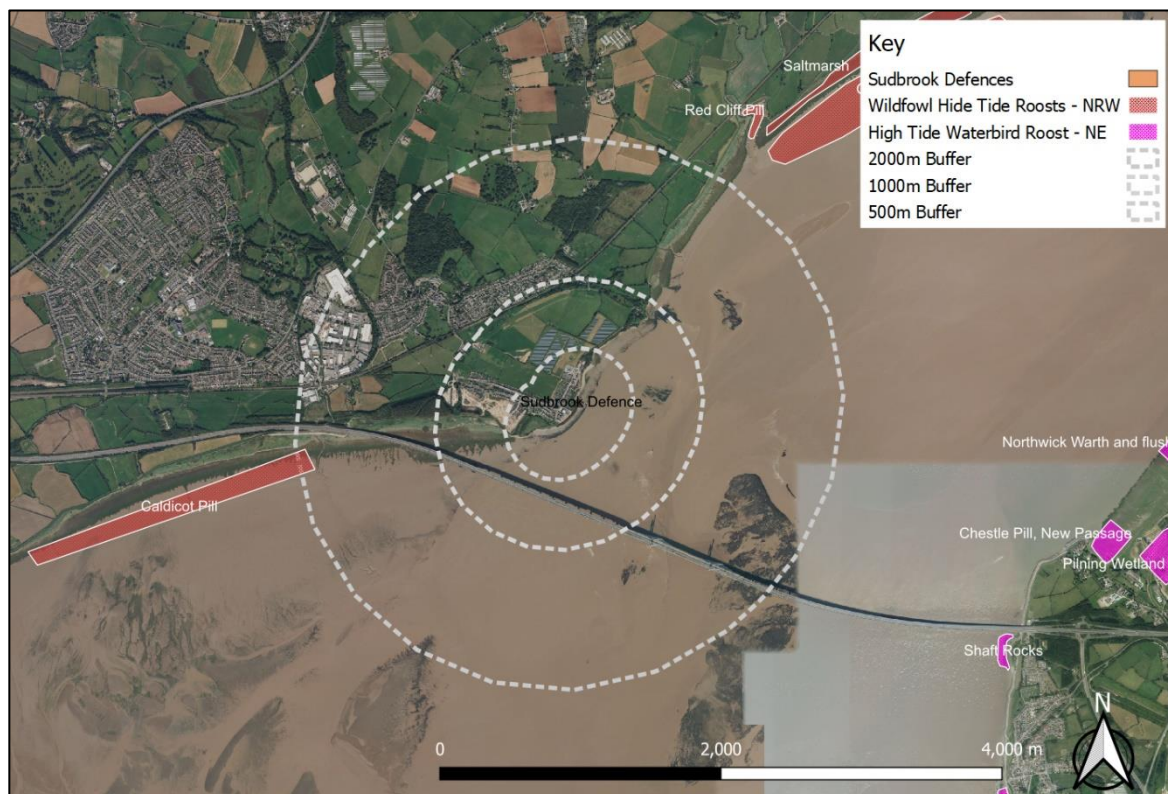


Figure 12: Roosts Slimbridge Area.

- 8.2.1 From the previous figures, the only roost that comes within a 2000m buffer of the project is Caldicot Pill situated within the Gwent Wetlands southwest, downstream of the project. The site is within the Undy sector and has a habitat composition predominately featuring mudflat and saltmarsh habitats exposed on neap tides.
- 8.2.2 The roost is recorded to support Curlew, Redshank, Shelduck, Wigeon and Mallard and is effectively utilised by wading birds all year round.
- 8.2.3 More high tide roosts and SPA primary roosts are further afield of these works (predominantly on the western shore), however as these roosts are further away from the project (beyond 2km), any mitigation measures for the closest roosts (Caldicot pill) will be of equal or additional benefit to those roosts located a greater distance from the maintenance works.



9. SEVERN ESTUARY SSSI

9.1 OVERVIEW



Figure 13: SSSI Designated Site boundary in relation to project area (blue overlay).

- 9.1.1 Referencing the available site citation, the Severn Estuary lies on the south west coast of Britain at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers.
- 9.1.2 The immense tidal range (the second highest in the world) and classic funnel shape make the Severn Estuary unique in Britain and very rare worldwide. The intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain.
- 9.1.3 The estuarine fauna includes: internationally important populations of waterfowl; invertebrate populations of considerable interest; and large populations of migratory fish, including the nationally rare and endangered Allis Shad (*Alosa alosa*)



9.2 SITE MANAGEMENT STATEMENT

9.2.1 The competent authorities (NRW & NE) both produce Site Management Statement's (SMS's), which outline the features that inform the overall status of a designated site. The features that inform the site in question are:

- ◆ Estuaries & Estuarine Processes
- ◆ Intertidal mud and sand
- ◆ Rocky shores
- ◆ Saltmarsh
- ◆ Reeds & Swamps
- ◆ Assemblage of birds
- ◆ Assemblage of fish
- ◆ Flood plain grazing marsh

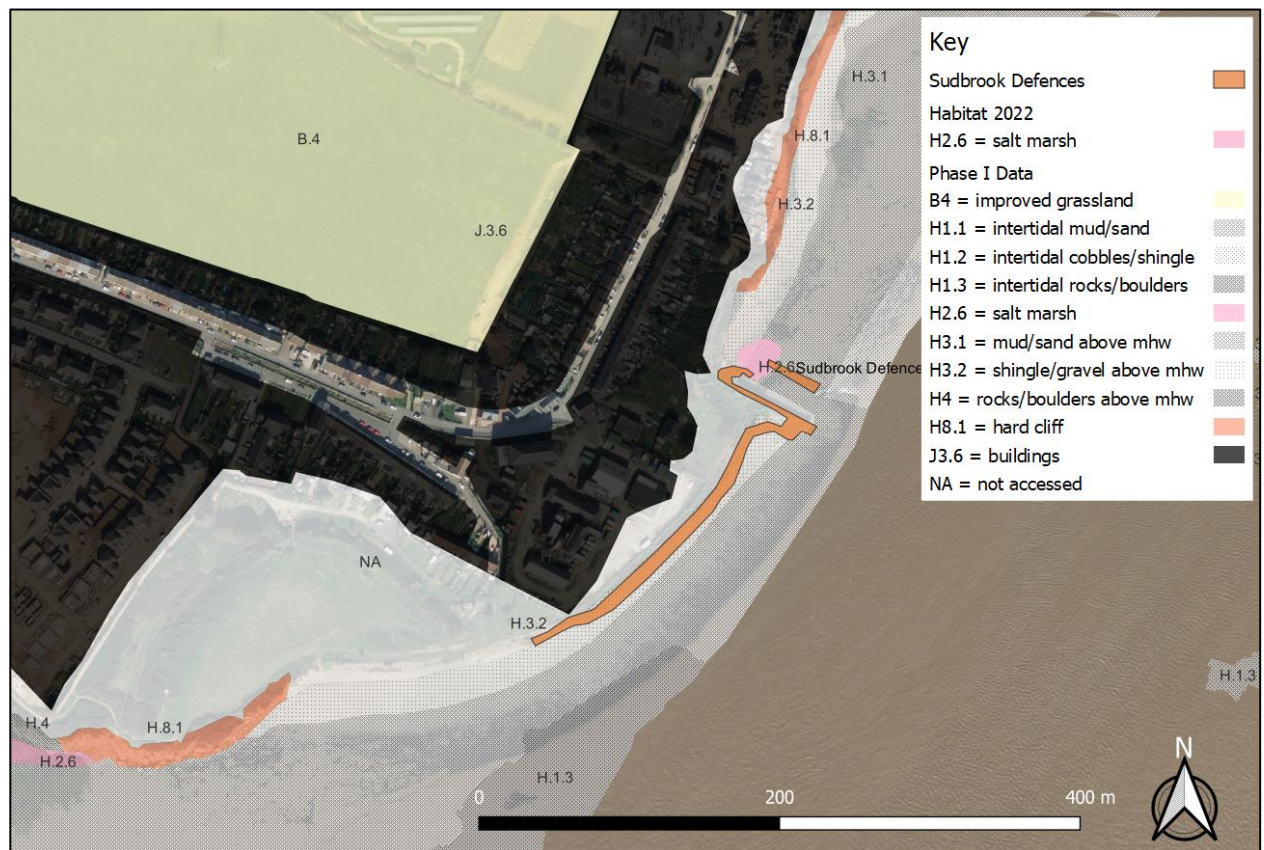
9.2.2 In addition to the highlighted features of importance. The SMS also outlines potential damaging vectors to a designated site features, summarised as Potentially Damaging Operations (PDO) lists. Below are the activities considered relevant to the proposed project (Table 2 below).

Table 2: PDO list from NRW Designated Site Finder Tool.

SMS Ref No:	Type of operation
19.	Erection and repair of sea defences or coast protection works, including cliff or landslip drainage or stabilisation measures.
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.
26.	Use of vehicles, or craft.



9.3 HABITAT PRESENT WITHIN WORKING FOOTPRINT



- 9.3.1 The habitat in which active works on the defences will predominantly be H3.1, 3.2 and H1.1, 1.2 and 1.3. Plant machine and on foot access will occur in these areas. It is expected these areas follow disturbance will reach equilibrium over a short period as the sediments in questions are predominantly made up of those (sand and shingle) that will drop out of suspension more readily.
- 9.3.2 In terms of Saltmarsh habitat. Vehicle access will not be permitted in this area. Foot access will be limited to what is absolutely necessary to enact reports to the walls below the tidal flap section of the defence.



10. PHYSICAL PROCESSES

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

10.1.1 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 and estuary.

10.1.2 The defences are contained within most north easterly section of Policy Unit CALD1 (Caldicot Levels).

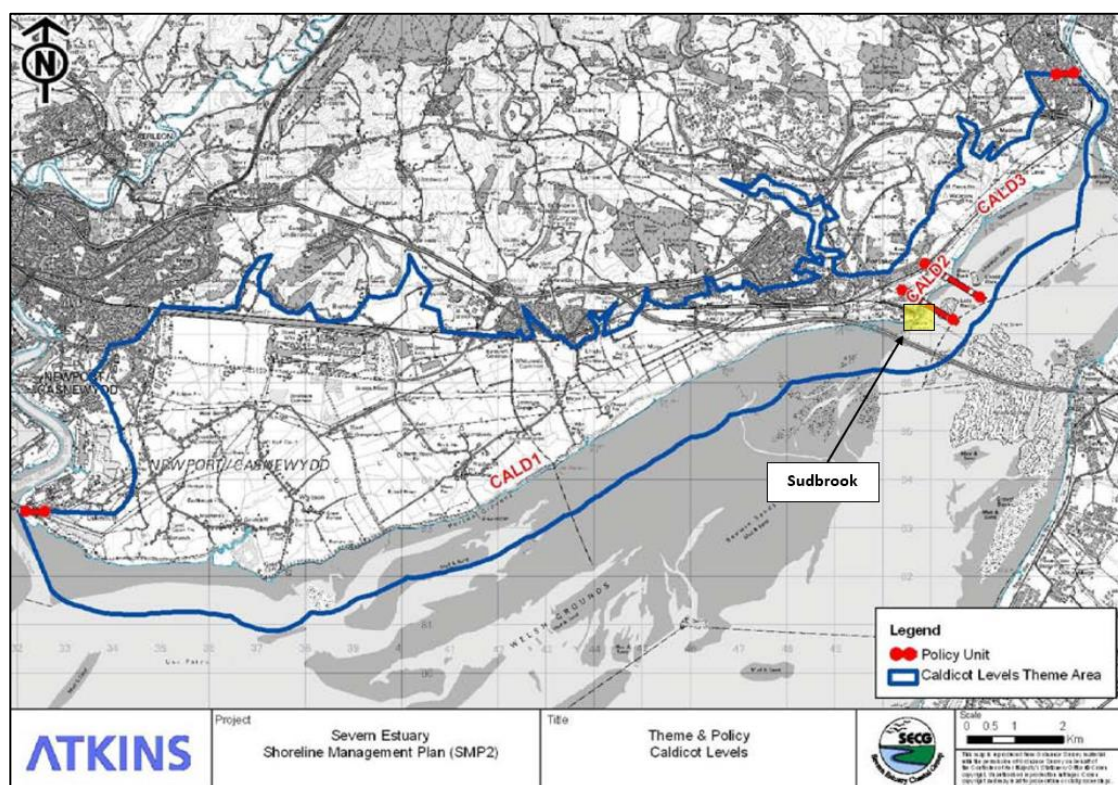


Figure 15: SMP2 - Policy Units

10.1.3 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.

10.1.4 As part of the SMP2, the chosen policies are measured against the potential economic impacts and environmental impacts projected over the course of time.

10.1.5 Table 12 below, described the project habitat loss as a consequence of the long-term preferred policy.

Table 3: Relevant Policy Unit description.

Policy Unit		Policy Plan			Comment
		2025	2055	2105	
CALD1	Uskmouth to Sudbrook	HTL	HTL	HTL	

Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention, MR – Managed Realignment



- 10.1.6 Regarding whether the proposed works are an infringement of preferred policy, this assessment deems the project as not challenging the current preferred policy units.
- 10.1.7 In addition, the works fit within the definition of minor works, outlined with the recent Welsh Government position statement regarding coastal processes.
- 10.1.8 It is conceivable that the current structural tolerances and functions will need to be reviewed in the light of future increased occurrences of high energy weather events, combined with incremental higher tide limits. However, such engineering and long-term infrastructure considerations are beyond the scope of these scour works and this Appropriate Assessment.



11. ASSESSMENT OF POTENTIAL IMPACTS RESULTING FROM SPECIFIC ACTIVITIES AND PROPOSED MITIGATION MEASURES – SUDBROOK DEFENCES

This section outlines the receptors of potential damaging vectors as a result of the proposed works and proposes appropriate mitigative measures to ensure that there is not a significant likelihood of impacts.

11.1 ANNEX I HABITATS – IMPACTS & MITIGATION

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Estuarine habitat	SAC/SSSI	Contamination of the estuary from spillage of hydrocarbons during refuelling of equipment or due to equipment failure. Or, concrete/mortar contamination as a result of masonry reporting or repairs to scour failures or failed toe beam.	All works set up and audited on a regular basis by the Environmental Clerk of Works (ECOW). A refuelling procedure will be implemented, whereby plant will be removed from the estuary prior to refuelling, plant nappies will be placed beneath fuelling apertures during fuelling and refuelling will only be undertaken by designated, trained individuals. NR have a spillage plan and specialised contractor in place to respond to and clean up spills. The Contractor will develop and implement an Emergency Awareness and Response Plan. GPP5 Guidance for Pollution Prevention - Works and maintenance in or near water, will be referenced to. These will include: ◆ GPP 5 - Works and maintenance in or near water ◆ GPP 7 - Safe storage – The safe operation of refuelling facilities, ◆ GPP 21 - Pollution incident response planning, ◆ GPP 22 - Dealing with spills 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. 9t Plant machine access via the existing path to the rear of the new development following the access routes marked on the previous figures in blue.	Negligible likelihood of significant impacts.



Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
			The machine, when not in use, will be removed from the estuary, situated at the top of the sea wall ramp, a significant distance away from MHWS. The machine will have spill protection placed beneath it and end of day checks implemented as an additional check combined with normal pre-works checks. If there is no safe location on the upper walls mixing of mortar will occur at beach/ground level. No mixing equipment, plant or machines will be used without a supply of spill kits, plant nappies and pre-works checks. All mixing to occur on beach level will make use of tarp or other impermeable membranes laid on the ground to prevent any overspill coming into contact with the estuarine habitat. Spill kits, drip trays and plant nappies will be placed below and near the 110v generators during operation. Plastic screening will be placed on the base of the wall to capture material removed from the sea defences during masonry repairs. Every practical effort will be made to collect all loose broken mortar material arising from the wall repairs and remove them from the designated site environment. For the larger volume of material required, a pre-mixed wagon will be situated within the Sudbrook compound and the cement/mortar will be pumped to the required location. Temporary shrouds will contain the setting concrete. Pours will be timed to ensure maximum setting times are achieved ahead of the returning tide. Rapid set marine grade mortars will be used. All hand tools for vegetation clearance will be checked prior to use and stored in secure areas and on spill mats when not in use. Equipment will be fuelled at the layby areas indicated prior to use. No refilling is permitted within or adjacent to the Salt Marsh habitats.	



Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Intertidal mudflats & sand flats (also part of estuarine habitat)	SAC/SSSI	Contamination of the estuary from spillage of hydrocarbons during refuelling of equipment or due to equipment failure.	See comments above under estuarine habitat.	Negligible likelihood of significant impacts.
Salt marshes (also part of estuarine habitat)	SAC/SSSI	Contamination of the estuary from spillage of hydrocarbons during refuelling of equipment or due to equipment failure.	Salt Marsh is present along the edges of the working area near the tidal flap. The contractor will ensure measures such as placement of tarps, covers any vulnerable areas of salt marsh habitat to limit the potential for contamination. See comments above under estuarine habitat.	Negligible likelihood of significant impacts.
Rocky shores (also part of estuarine habitat)	SAC/SSSI	No impact	See comments above under estuarine habitat.	Negligible likelihood of significant impacts.
Reedbeds/ swamps	SAC/SSSI	No impact	See comments above under estuarine habitat	No impact
Neutral grassland	SAC/SSSI	No impact	See comments above under estuarine habitat	No impact
Estuarine Habitat	SAC/SSSI	Loss of Habitat as a result of vehicle movement.	It is possible shingle and sand habitat traversed along the very edges of sea wall will be disturbed by the movement of the plant vehicle. However, the proposed use of a plant machine is limited to the foreshore below the sea walls and will avoid the saltmarsh habitat. Furthermore, it is expected that any disturbed sand flat or shingle habitat will be temporary, with sediment material remobilising following incoming tides and will quickly be deposited into its previous alignment. As there will be a limited of one plant machine for the duration of the project. Overall traffic along the foreshore during the project will be very limited.	Negligible likelihood of significant impacts.
Estuarine Habitat	SAC/SSSI	Loss of Habitat as a result of structure repairs.	The repairs will not cause an increase in the horizontal footprint of the defences in such a manner which could cause direct habitat loss as a result of an enlarged defence footprint.	Negligible likelihood of significant impacts.



Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
			In terms of long-term impact. The repairs represent maintenance as outlined in the Welsh Government position statement on coastal squeeze and does not deviate from the Shore Line Management Plan 2 – preferred policy of Hold the Line.	

11.2 ANNEX II SPECIES – IMPACTS & MITIGATION

Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
Aggregations of bird species	SSSI / SPA / RAMSAR	Noise disturbance / Visual Disturbance.	Maintenance work will result in a period of noise and visual disturbances. However, noise levels are unlikely to exceed those currently generated by road traffic currently utilising the Severn Road Crossing and adjacent ongoing residential developments The vast majority of works will be undertaken during the day, at low/receding tide conditions. Works to the walls above or seaward of MHWS during peak high tide is not permitted as part of the works. Some supporting works during high tide may occur within the boundary of the upper sea defences. Such as mobilisation or demobilisation of rope access equipment or offloading of material to be closer to working locations. Should the night shift be required, then the contractor will avoid working at dawn or dusk to avoid impacting the crepuscular cycle of local bird and other animal populations. Works will consist of 30-60m sections of sea defence worked on at any given time to further reduce overall cumulative noise and visual impacts. This will only impact small sections of the estuary at any one time. Paddle mixture equipment will use low nose electric motors to mix the required material. The 11v generator will only run when required and will be placed in such a way that noise emissions are intercepted by structures such as wall, or barriers to deaden noise further. Task lighting (if required) will face the reliant work locations and will not face directly out into the estuary using flat glass luminaires.	Negligible likelihood of significant impacts.



Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
			Toolbox talks will be provided by the Environmental Clerk of Works prior to works commencing. This will identify potential impacts and direct localised mitigation where required. The assessment acknowledges the proximity to potential low tide foraging areas. As such, during poor weather conditions during winter, works will be avoided. This will both serve a safety critical component while also ensuring the bird assemblage is not unduly disturbed when looking for shelter during winter storms. In terms of visual buffers, the asset is a significant distance away between 1-2km from the closest high tide roosts. Assuming similar SPA visual guidelines to other sites. It is very likely that a 200m buffer from significant portions of the projected bird assemblages can be maintained, as when the water levels encroach on the working areas, teams will largely demobilise.	
Fish Assemblage	SAC/SSSI	Contamination of the estuary from spillage	See comments under estuarine habitat	Negligible likelihood of significant impacts.
Vascular plant assemblage associated with salt marsh (part of estuarine habitat)	SAC/SSSI	No impact	See comments under estuarine habitat	Negligible likelihood of significant impacts.
Otter (Lutra Lutra)	Local Populations	Noise disturbance / Visual Disturbance / Habitat Destruction.	Otter populations are known to be present within the Severn Estuary. Toolbox Talks (TBTs) will inform site personnel on identifying the Annex II Species. No otter holts have been noted to date within proximity to the structure and are unlikely to be found during works on the seaward facing wall sections. Habitat impact is limited, and it is not anticipated that these works will have an impact on the wider population and Otter policy objectives of the Core Management Plan. Additionally, no equipment will be left in such a manner that an animal could become snared and trapped within the working area.	Negligible likelihood of significant impacts.



Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
			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 and other species of the assemblage, 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 defences, it is unlikely that this will present a significant determinantal impact to salmon and other species of fish migrating to spawn during the coming winter months. If night working is required, directional lighting measures will be implemented to limit disturbance. Task specific lighting will be used, and the use of flood lights will be prohibited. Steps should be undertaken to ensure that otters, mammals and birds do not become trapped within working and storage areas (e.g., small pieces of equipment, or stowed away ropes are likely to be left on site on a semi-regular basis).	
Fish Assemblage	SAC/SSSI	Noise Disturbance / Visual Disturbance / Habitat Destruction.	Work will be undertaken 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 has been granted by Natural Resources Wales. Works will be undertaken within the estuary during the 2022 – 2023 spawning seasons for protected and migratory fish. ◆ The works will not present a barrier to the permanent flowing portion of the estuary. During high tide, it will be possible for fish to migrate along vast majority of the estuary without coming into proximity to any tasks being undertaken at that particular moment.	Impact Not Likely to be Significant, with appropriate mitigation



Receptor	Affected Site	Potential Hazard	Mitigation Measures	Likelihood of Impact
			◆ Works within the estuary during low tide at bed level will be localised and low impact and will not involve any deep excavation or dredging. No increase in structure footprint is envisaged. ◆ The sea defences is in proximity to the Severn road crossing and busy estuary vessel traffic. This implies that fish within the estuary are habituated to a level of noise and vibration in the general area. ◆ Best practice will be used in terms of the construction methodology to limit this i.e., modern well silenced plant, use of manual tools to rake out masonry during repointing, working on the wall and embankments during low tide. ◆ 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.	



12. POTENTIAL IN-COMBINATION EFFECTS

12.1 OVERVIEW

- 12.1.1 It is necessary to consider the potential for significant effects from this project in-combination with other plans or projects.
- 12.1.2 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.
- 12.1.3 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.
- 12.1.4 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.

13. KNOWN PROJECTS WITHIN THE WIDER AREA

- 13.1.1 There is currently no known large-scale project in a proximity to the proposed maintenance areas which could cause in combination effects.
- 13.1.2 However, should NRW have upcoming FRAP's or other Marine Licenses in place that are soon to be undertaken or currently being undertaken, then the maintenance will be undertake at a period that achieves the least in-combination impacts possible.



14. HRA CONCLUSION

- 14.1.1 This section will combine the key features and challenges highlighted in the CMP's and proposed to mitigation to ascertain whether likely significant impacts to the designated site could occur.
- 14.1.2 Limited working periods, predominantly during daytime low tide, reduces the intensity if the works, will also maintaining consideration for birds during challenging winter weather conditions, will ensure bird in a vulnerable position will not be unduly disturbed.
- 14.1.3 Localised SPA/RAMSAR bird population are likely habituated to the presence of moving vehicles, local fishers and walkers. Consequently, operatives access the site predominantly on foot and the use of a single plant machine will be unlikely to cause an excessive elevated level of normal activity. It is envisaged that the works will have little impact on the protected areas and wildlife therein, with no determinantal impact to the current condition assessment of Annex features.
- 14.1.4 No repairs to the seaward facing sections of the defence will occur during peak hightide, but equipment preparation of safety set up may occur ahead of a receding tide.
- 14.1.5 In terms of terms of the fish assemblage, the works will not create underwater noise, nor will works occur within the water itself. There will be no alteration or impediment of normal migratory of foraging locations.
- 14.1.6 Refuelling and emergency response procedures as per Management Plan (MP) preparations. The implementation of this will be monitored and audited by a Project Managers from Dyer & Butler and Environmental specialist (EcoVigour).
- 14.1.7 The use of a single 9t machine on the predominantly sand and shingle foreshore habitat, will be very localised and likely not detrimentally impact the Annex I feature of the designated site. As the machine is to be used for a single part of the overall works, it's cumulative impact of use is highly limited.
- 14.1.8 Localised vegetation clearance at the structures will not remove any Annex I habitats from the designated sites.
- 14.1.9 The project does not represent a deviation from the current Shore Line Management Plan policy and the scope of works is in concurrence with the Welsh Government Position Statement on coastal asset management.
- 14.1.10 The ECoW will undertake a pre check of the access route and immediate working areas.
- 14.1.11 From the available information and proposed mitigation measures, it is assessed that the high tide habitat below the defences at the works site will not be significantly impacted, nor species or features relevant to the designated site as a whole.
- 14.1.12 The exact timing of the works will be agreed with NRW, dependent on whether there are further in combination impacts that require specific working dates.
- 14.1.13 In conclusion therefore, the proposed mitigation measures will ensure that no significant impact to the designated site will occur as a result of the proposed works.



15. APPENDIX A - BIOSECURITY MANAGEMENT PLAN & RISK ASSESSMENT





16. APPENDIX B- PROJECT TECHNICAL DOCUMENTS

