

# Hayling Island Coastal Management Strategy

Habitats Regulations Assessment – Draft for Statutory  
Consultation

Havant Borough Council

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## Quality information

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# 1. Introduction

- 1.1 AECOM was commissioned by Coastal Partners on behalf of Havant Borough Council (HBC) to undertake a Habitats Regulations Assessment (HRA) of the emerging Hayling Island Coastal Management Strategy (HICMS). The objective of a HRA is to identify whether any aspect of a plan or project has the potential to result in Likely Significant Effects (LSEs) or, where present, adverse effects on the integrity of European sites (including Special Areas of Conservation (SACs), Special Protection Areas (SPAs), candidate Special Areas of Conservation (cSACs), potential Special Protection Areas (pSPAs) and, as a matter of Government policy, Ramsar sites). Because Coastal Partners already undertook an initial LSEs screening exercise at the options appraisal stage<sup>1</sup>, this document focuses solely on the Appropriate Assessment and derogation stages of the HRA. Under the Conservation of Habitats and Species Regulations 2017 (as amended), an Appropriate Assessment (AA) is required where a plan or project is likely to result in LSEs upon a European Site, either individually or 'in combination' with other projects. Where adverse effects are likely, the HRA is to advise on appropriate policy mechanisms and approaches for delivering mitigation. Should potential adverse effects be unavoidable, the HRA must also provide evidence that the applicable derogation tests are met, including Imperative Reasons of Overriding Public Interest (IROPI) and No Reasonable Alternatives, and adequate compensation is being secured.
- 1.2 The HRA screening<sup>2</sup> undertaken by Coastal Partners at the options appraisal stage of the HICMS identified various impact pathways that are associated with coastal management approaches, including, but not limited to, 'Do Nothing' (allowing defences to fail and natural processes to resume), 'Do Minimum' (e.g. patch-and-repair works to prolong the life of existing defences), 'Sustain' (maintain a consistent Standard of Protection (SoP) by raising defences to keep pace with sea level rise), 'Managed Realignment' (introducing setback defences with the aim of habitat creation) and 'Resilience' (Property Flood Resilience measures targeting specific at-risk assets rather than providing protection along an entire length of frontage). Given the relatively broad nature and early developmental stage of the HICMS at the time, the screening report was inclusive and determined that it was not possible to screen out certain impact pathways. It was also not possible given the stage of development of the HICMS, to undertake an AA at that point.
- 1.3 However, since that time, AECOM's Leading Options Appraisal Report (OAR) for the strategy has been produced. This provides more detailed and specific proposals for each Option Development Unit (ODU), covering the entire frontage of Hayling Island. Further detail on the Leading Options and associated HRA implications can be found in **Table 1. Figure 1** below shows the ODUs included in the HICMS in relation to relevant European sites. The screening report concluded that the HICMS does not have the potential to result in LSEs on the Solent and Dorset Coast SPA, primarily because it will not affect the behaviour of foraging terns nor the availability of their prey. However, LSEs on the Chichester and Langstone Harbours SPA / Ramsar and Solent Maritime SAC due to a range of linking impact pathways could not be excluded alone. It is noted that several impact pathways considered in the screening report are no longer relevant because some structures and / or construction techniques are no longer proposed under the OAR, specifically:
- Subtidal habitat loss due to beach nourishment, offshore breakwaters, creek flood barriers and harbour-wide flood barriers / barrages;
  - Barrier to species movements due to offshore breakwaters, creek flood barriers and harbour-wide barriers; and
  - Changes to coastal processes (e.g. emergence regime, wave exposure) as a result of offshore breakwaters, creek flood barriers and barrages.

<sup>1</sup> Coastal Partners. (January 2021). Hayling Island Coastal Management Strategy 2120 Habitats Regulations Assessment – Screening Report (Likely Significant Effects). 78pp.

<sup>2</sup> Coastal Partners. (January 2021). Hayling Island Coastal Management Strategy 2120 – Habitats Regulations Assessment Screening Report (Likely Significant Effects). Commissioned by Havant Borough Council. 78pp.

**Table 1: Summary of the HICMS Leading Options proposed for each ODU, including detail on structures or interventions provided and additional information relevant to HRA.**

ODU	Location	Overall Approach	Detail of Structures / Interventions Provided	Additional Information (e.g. Habitat Creation)	Management Intent
ODU 1	Langstone Bridge to Northney Farm	Managed Realignment Hybrid (Sustain) 0.5% AEP (sub-units comprising different management approaches)	<p>Construction of a frontline floodwall on the west (including in front of the access road to Langstone Quays Resort; sub-unit 1A), a setback embankment along the central section (sub-unit 1B) and frontline protection of the historic landfill in epoch 1 (sub-unit 1C). The residual life of existing defences is between 10 and 20 years.</p> <p>Create intertidal habitat in front of the setback defences on the east side.</p>	<p>Creation of intertidal habitat in the central section (Epoch 1) – offsets coastal squeeze impacts elsewhere within the HICMS and helps deliver on the Habitat Compensation and Restoration Programme (HCRP) targets.</p> <p>Further details including the defence alignments, exact heights and lengths will be investigated as part of the scheme appraisal process following the HICMS.</p> <p>Frontline protection in the east (ODU 1c) is positive because it protects the existing landfill site from flooding and erosion.</p>	<p>ODU 1A – Maintaining the viability of Northney Road and the A3023 into the future as sea levels rise.</p> <p>ODU 1B – Maintaining flood protection to properties while making space for nature and ensuring a more sustainable defence alignment into the future.</p> <p>ODU 1C – Preventing landfill erosion into the harbour due to future sea level rise.</p>
ODU 2	Northney Marina	Resilience (Property Flood Resilience)	<p>Maintenance (including patch and repair) of existing frontline flood defences at Northney Marina</p> <p>Property Flood Resilience measures for all properties at risk in epochs 1, 2 and 3 (implemented in the relevant epoch where they become at risk)</p> <p>Do Nothing approach in all areas where there are no assets or infrastructure at risk</p>		Landowners to maintain their own flood and erosion protection to assets and businesses or adapt to become more resilient to future flooding.
ODU 3	Northney Farm to Chichester Road	Managed Realignment (Sustain)	Construction of setback earth embankment in epoch 1 (residual life of existing defences less than 10 years) with intertidal habitat created in front of the setback defence.	<p>Creation of intertidal habitat in front of setback defences in epoch 1 (2022-2042).</p> <p>Further details including the defence alignments, exact heights and lengths will be investigated as part of the scheme appraisal process following the HICMS.</p>	Maximising agricultural opportunities while making space for nature and ensuring a more sustainable defence alignment into the future.

ODU	Location	Overall Approach	Detail of Structures / Interventions Provided	Additional Information (e.g. Habitat Creation)	Management Intent
				Key area for habitat delivery identified in the Solent and South Downs HCRP, with a mosaic of habitats to be delivered.	
ODU 4	Chichester Road to Mill Rythe Junior School	Resilience (Property Flood Resilience)	<p>Maintenance (including patch and repair) of existing frontline defences along the ODU.</p> <p>Property Flood Resilience measures for all properties at risk in epochs 1, 2 and 3 (implemented in the relevant epoch where they become at risk).</p> <p>Do Nothing approach in all areas where there are no assets or infrastructure at risk</p>	Frontline protection is positive because it protects the existing landfill site from flooding and erosion.	Landowners to maintain their own flood and erosion protection to assets and businesses or adapt to become more resilient to future flooding.
ODU 5	Mill Rythe Junior School to Salterns Lane	Managed Realignment (Sustain) 1.33% AEP (sub-units comprising different management approaches)	<p>Construction of setback embankment along central section of the ODU (sub-unit 5B) in epoch 1 (residual life of existing defences between 10 and 20 years) with intertidal habitat created in front of the setback defence.</p> <p>Maintenance of existing frontline defences at the northern (sub-unit 5A) and southern (sub-unit 5C) ends of the ODU.</p>	<p>Creation of intertidal habitat in front of defences along most of ODU 5 in epoch 1 (2022-2042).</p> <p>Further details including the defence alignments, exact heights and lengths will be investigated as part of the scheme appraisal process following the HICMS.</p>	<p>ODU 5A – Maintaining and improving flood protection to properties and businesses.</p> <p>ODU 5B – Making space for nature by creating a more sustainable defence alignment into the future.</p> <p>ODU 5C – Landowners to maintain and improve their own flood protection to assets and businesses or adapt to become more resilient to flooding into the future.</p>
ODU 6	Salterns Lane to Wilsons Boat Yard	Maintain then Improve 0.5% AEP from 2072	<p>Maintenance of existing defences in epochs 1 and 2 (2022 – 2072) to maximise their residual life</p> <p>Property Flood Resilience measures for all properties at risk in epochs 1 and 2 (implemented in the relevant epoch where they become at risk)</p>	Any new flood defences should not act as a barrier for human access to the foreshore, which will be considered in the design.	Maintaining flood protection to residents, community and businesses at Selsmore.



ODU	Location	Overall Approach	Detail of Structures / Interventions Provided	Additional Information (e.g. Habitat Creation)	Management Intent
			Construction of a new frontline floodwall in 2072 in epoch 3		
ODU 7	Wilson's Boat Yard to Fishery Creek	Sustain 0.5% AEP	Construction of frontline rock revetment in epoch 1 (residual life of existing defences between 10 and 20 years)	Frontline protection is positive because it protects the existing landfill site at Selsmore and Fishery Creek from flooding and erosion.	Maintaining flood protection to residents, community and businesses at Selsmore.
ODU 8	Eastoke	Sustain 0.5% AEP	<p>Construction of frontline flood defences in epoch 1 (residual life of existing defences between 10 and 20 years).</p> <p>This includes a range of defences in different sub-areas (A-G), comprising varying lengths of rock revetments, crest raising, floodwalls and setback floodwalls. Replacement of all groynes with new rock groynes and continued beach nourishment and recycling.</p>	Replacing groynes may be associated with coastal geomorphological processes (e.g. cross-shore sediment transport) and loss of intertidal and subtidal habitats.	<p>ODU 8 (North) – Construct new defences (flood walls and set back floodwalls), maintain and raise over time to keep pace with sea level rise.</p> <p>ODU 8 (South) – Maintaining a healthy beach alongside new rock groynes, construct new defences, maintain and raise over time to keep pace with sea level rise.</p>
ODU 9	Eastoke Corner to Inn on the Beach	Sustain 0.5% AEP – Maintain Inn on the Beach	<p>Construction of asset-focussed setback floodwall in epoch 1 with additional lengths being added in epochs 2 and 3 to keep pace with sea level rise (residual life of existing defences between 10 and 20 years).</p> <p>Capital refurbishment of the defences in front of the Inn on the Beach to allow it to continue to act as a terminal groyne for sediment accretion and maintaining the beach profile. All timber groynes will be replaced with new rock groynes, maintaining overall size of the groyne field.</p> <p>Continued beach nourishment and recycling.</p>	Replacing groynes may be associated with coastal geomorphological processes (e.g. cross-shore sediment transport) and loss of intertidal and subtidal habitats.	Maintaining a healthy beach alongside flood and erosion protection to residents, community and businesses along the seafront.

ODU	Location	Overall Approach	Detail of Structures / Interventions Provided	Additional Information (e.g. Habitat Creation)	Management Intent
ODU 10	Inn on the Beach to North Shore Road	Resilience (Property Flood Resilience)	<p>Maintenance (including patch and repair) of existing frontline defences along the northern part of the ODU at the Kench.</p> <p>Property Flood Resilience measures for all properties at risk in epochs 1, 2 and 3 (implemented in the relevant epoch where they become at risk).</p> <p>Do Nothing approach in all areas where there are no assets or infrastructure at risk.</p>	<p>Erosion zones mapped by Coastal Partners indicate dynamic movement of the beach in the southern (West Beach) area of the ODU, including beach accretion at Gunner Point to 2072.</p> <p>The maintenance of the Inn on the Beach (ODU 9) could affect how sediment is fed into West Beach, with localised erosion of areas of beach.</p>	<p>Making space for nature while landowners maintain their own flood and erosion protection to assets and businesses or adapt to become more resilient to flooding in the future.</p> <p>ODU 10 (North) – Private maintenance or replacement of defences by landowners or adaptation.</p> <p>ODU 10 (South) – Allow the coast to evolve as naturally as possible alongside private maintenance or replacement of defences or adaptation by landowners.</p>
ODU 11	North Shore Road	Sustain 1.33% AEP	Construction of new frontline floodwall in epoch 1 (residual life of existing defences between 10 and 20 years) and an additional length of defence in the east of the ODU in epoch 2.		Maintaining flood and erosion protection to residents.
ODU 12	North Shore Road to Newtown	Do Nothing	Do Nothing along this undefended stretch of coastline, which will allow the coastline to evolve naturally	This section of coastline adjoins a Brent goose refuge area (H34C North), which may be at risk of flooding without any protection in place (note this also applies to functionally linked habitats in areas where managed realignment is proposed).	Making space for nature by doing nothing.
ODU 13	Newtown	Maintain then Sustain 0.5% AEP from 2042	<p>Maintenance of existing frontline defences in epoch 1 (2022 – 2042) to maximise their residual life (which is between 10 and 20 years and noting the low risk of flooding in this ODU)</p> <p>Construction of a new frontline floodwall in 2042 in epoch 2</p>	This option provides adequate protection to all infrastructure, including the Hayling Island Billy Trail, which is an important recreational resource on the island.	Maintaining flood and erosion protection to residents, community and businesses at Newtown.

ODU	Location	Overall Approach	Detail of Structures / Interventions Provided	Additional Information (e.g. Habitat Creation)	Management Intent
ODU 14	Newtown to Stoke	Do Nothing	Do Nothing along this stretch of coastline, allowing the existing frontline defences to fail (in approx. 10 years) and the coastline to evolve naturally	This section of coastline adjoins several Brent goose refuge areas and SWBGS sites, which may be at risk of flooding without any protection in place (note this also applies to functionally linked habitats in areas where managed realignment is proposed).	Making space for nature by doing nothing, but consider relocating sections of the Hayling Island Billy Trail to maintain access.
ODU 15	Stoke to Langstone Bridge Car Park	Sustain 0.5% AEP	<p>Construction of setback embankment in epoch 1 (residual life of existing defences between 10 and 20 years)</p> <p>Maintenance of existing frontline defences where they protect the historic landfill to prevent flooding and erosion</p>	<p>Further details including the defence alignments, exact heights and lengths will be investigated as part of the scheme appraisal process following the HICMS.</p> <p>Frontline protection is positive where it protects the existing landfill site from flooding and erosion.</p>	Maintaining the viability of the Hayling Island Billy Trail and the community at Stoke, while making space for nature and creating a more sustainable future defence alignment where appropriate into the future.
ODU 16	Langstone Bridge Car Park to Langstone Bridge	Sustain 0.5% AEP	Construction of new frontline floodwall embankment in epoch 1 (residual life of existing defences between 10 and 20 years)		Maintaining the viability of the A3023 into the future as sea levels rise.

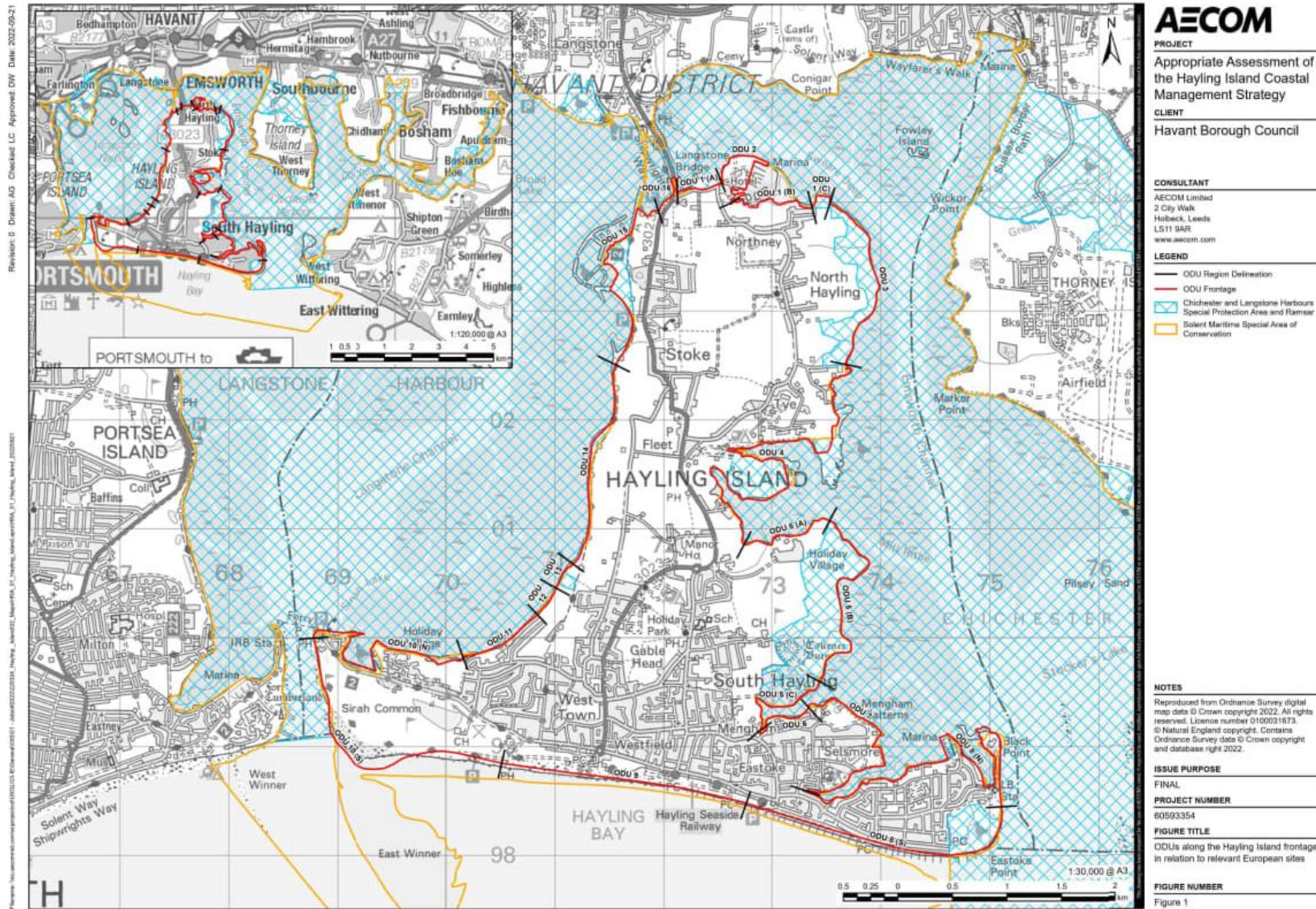


Figure 1: ODUs included in the HICMS in relation to the Chichester and Langstone Harbours SPA / Ramsar and Solent Maritime SAC.



- 1.4 One of the most pertinent impact pathways connected to coastal management is the loss of intertidal habitats through a process referred to as coastal squeeze. This process prevents the landward migration of important intertidal habitats (e.g. Atlantic saltmarsh, mudflats) in response to sea level rise. As a result, these habitats are 'squeezed' and contract in size, before eventually being lost. Hold the Line management approaches, which contribute to coastal squeeze, are typically required along urbanised sections of coastline in order to protect significant infrastructure and peoples' homes. Conversely, Do Nothing and Managed Realignment interventions provide the opportunity to create new intertidal habitats, offsetting some of the habitat losses along other areas of the frontage.
- 1.5 Importantly, the overarching North Solent Shoreline Management Plan (NSSMP), which sets the broad strategic approach to coastal management along the coastline that includes Hayling Island, has already been subject to HRA and the derogation tests. That HRA concluded that adverse effects on the integrity of European sites in the Solent regarding intertidal habitat loss could not be excluded and would require compensation in the form of new habitat creation. As part of the planning approval process, the Secretary of State approved the broad management plan for the Hayling Island coastline. It was agreed that habitat compensation should be delivered under the umbrella of the Solent and South Downs HCRP. The NSSMP sets the overall broad policy for the frontage; the HICMS then provides more detail regarding particular sections, including reviewing the overall policy of the NSSMP on which habitat compensation calculations for the entire North Solent were based, and providing opportunities at a very local level to deviate from that broad policy. Once the HICMS is adopted, individual schemes will be devised for planning consent which will contain the fullest detail regarding what will actually be undertaken to achieve the policy set out by the NSSMP and the HICMS.
- 1.6 The HRA of the HICMS appraises the impact pathways projected to occur due to the Leading Options proposed in the strategy. The impact pathways addressed in this Appropriate Assessment comprise:
- Intertidal and supralittoral habitat loss through coastal squeeze (the former placed into context of the habitat loss calculations and compensation requirements identified at the SMP level);
  - Loss of landward SPA / Ramsar habitats and functionally linked high-tide roosts and foraging areas as a result of Do Nothing and Managed Realignment;
  - Changes to coastal hydrogeomorphological processes due to any new cross-shore structures (e.g. groynes);
  - Permanent loss of subtidal and intertidal habitats due to cross-shore structures (e.g. replacement groynes);
  - Recreational disturbance to qualifying birds in the SPA / Ramsar and / or functionally linked habitats; and
  - Erosion, flooding and disturbance of contaminated land.

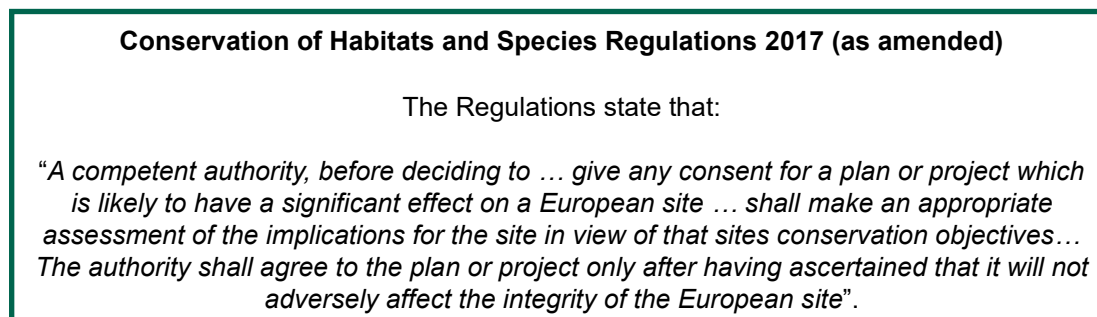
## Legislation

- 1.7 The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). This established a transition period, which ended on 31 December 2020. The Withdrawal Act retains the body of existing EU-derived law within our domestic law. The most recent amendments to the Habitats Regulations – the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 – make it clear that the need for HRA continues after Brexit.
- 1.8 The HRA process applies the 'Precautionary Principle'<sup>3</sup> to European sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of

<sup>3</sup> The Precautionary Principle, which is referenced in Article 191 of the Treaty on the Functioning of the European Union, has been defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as: "When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis".

the European site(s) in question. Plans and projects with predicted adverse impacts on European sites may still be permitted if there are no less damaging alternative solutions to them and there are IROPI as to why they should go ahead. In such cases, compensatory mechanisms are required to preserve the overall integrity of the site network.

- 1.9 In order to ascertain whether or not site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question (see **Figure 2** below):



**Figure 2: The legislative basis for Appropriate Assessment**

- 1.10 Over time the term HRA has come into wide currency to describe the overall process set out in the Conservation of Habitats and Species Regulations 2017 (as amended) from screening through to derogation. This has arisen in order to distinguish the process from the individual stage described in the law as an ‘Appropriate Assessment’.
- 1.11 In spring 2018 the ‘Sweetman’ European Court of Justice ruling<sup>4</sup> clarified that ‘mitigation’ (i.e. measures that are specifically introduced to avoid or reduce a harmful effect on a European site that would otherwise arise) should **not** be taken into account when determining LSEs and only be considered at the Appropriate Assessment stage. This HRA has been cognisant of that ruling.

## Scope of the HRA

- 1.12 There is no guidance that dictates the physical scope of an HRA of a Plan or Strategy document in all circumstances. Therefore, in determining the physical scope of the assessment, AECOM was guided primarily by the identified impact pathways (called the source-pathway-receptor model) rather than by arbitrary ‘zones’. Current guidance suggests that the following European sites be included in the scope of assessment:
- All sites within the geographic boundary of Hayling Island; and,
  - Other sites shown to be linked to the HICMS through a known impact ‘pathway’ (discussed below).
- 1.13 Briefly defined, impact pathways are routes by which the implementation of a coastal management approach within the HICMS may lead to a negative effect upon a European site. An example of this would be the loss of inland habitats that support overwintering SPA / Ramsar waterfowl and waders due to the adoption of ‘Do Nothing’ and ‘Managed Realignment’ approaches on Hayling Island. Such habitat loss may affect Solent Wader and Brent Goose Strategy (SWBGS)<sup>5</sup> Core Areas and Primary Support Areas and be cumulative in nature (i.e. multiple habitat parcels being lost and resulting in a broader network impact).
- 1.14 Guidance from the Ministry of Housing, Communities and Local Government (MHCLG) states that a HRA should be ‘*proportionate to the geographical scope of the [policy / management approach]*’ and that ‘*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*’<sup>6</sup>. More recently, the Court of Appeal ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be ‘*achieved in practice*’

<sup>4</sup> People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

<sup>5</sup> Whitfield, D (2020) Solent Waders and Brent Goose Strategy Hampshire and Isle of Wight Wildlife Trust. Curdridge.

<sup>6</sup> Ministry for Housing, Communities and Local Government. (2006). Planning for the Protection of European Sites, Consultation Paper. It is to be noted that this department has since been renamed as the Department for Levelling Up, Housing and Communities (DLUHC).

to satisfy that the proposed plan or strategy would have no adverse effect, then this would suffice. This ruling has since been applied to a planning permission (rather than a high-level strategic document). In this case the High Court ruled that for ‘a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of Reg 61 of the Habitats Regulations.’<sup>7</sup>

1.15 This is relevant because the HICMS constitutes the middle tier in a three-tier planning system. The highest tier is the SMP, while the lowest tier is the individual scheme for which planning consent is sought. HRA is required at all three tiers. Some impacts cannot be meaningfully assessed at the middle, HICMS, tier because whether they will arise or not cannot be determined until a particular scheme is designed. This is particularly true regarding visual and noise disturbance of SPA birds as the potential for an impact depends on the nature of the plant employed in the works, where that plant will be used, the duration of the works and the seasonal timing of the works. None of these are known at the HICMS level. Therefore, this impact pathway will be addressed in the AA of each scheme before it can be consented, thus ensuring the European sites are protected. Another impact that cannot be determined until the scheme level is the precise extent of any habitat losses due to scheme footprint. For example, a decision to ‘Hold the Line’ will be known at SMP and HICMS level, but the footprint of any direct habitat loss will depend upon factors such as exactly what intervention is chosen. Sheet piles have a much smaller footprint than a more traditional flood wall but can result in other impact pathways such as reflection erosion. This cannot be assessed until the scheme level since the HICMS does not make decisions over whether sheet piles or other techniques will be used.

1.16 In order to fully inform this AA, a number of documents, studies and other information sources have been consulted to form the evidence base of this HRA. These include:

- Guidance published by the European Commission on the assessment of plans and projects in relation to Natura 2000 sites (European sites)<sup>8</sup>;
- Habitats Regulations Assessment Screening Report of the Coastal Management Strategy undertaken by Coastal Partners<sup>9</sup> and comments on that document provided by Natural England;
- Screening and Scoping Opinion on the Hayling Island Coastal Management Plan by Havant Borough Council<sup>10</sup>;
- AECOM’s Technical Note on how intertidal habitat loss due to coastal squeeze and intertidal habitat creation calculations are approached<sup>11</sup> and Natural England’s consultation response agreeing to the approach<sup>12</sup>;
- Habitats Regulations Assessment of the Havant Borough Local Plan<sup>13</sup>;
- North Solent Shoreline Management Plan (SMP)<sup>14</sup> and its accompanying HRA;

<sup>7</sup> High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015.

<sup>8</sup> European Commission. (October 2021). Commission Notice – Assessment of plans and projects in relation to Natura 2000 sites. Methodological guidance on the provision of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. 107pp. Available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC1028\(02\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC1028(02)&from=EN) [Accessed on the 21/09/2022]

<sup>9</sup> Coastal Partners. (January 2021). Hayling Island Coastal Management Strategy 2120 Habitats Regulations Assessment – Screening Report (Likely Significant Effects). 78pp.

<sup>10</sup> Comments by the Council were provided in a consultation letter dated 24<sup>th</sup> of May 2021.

<sup>11</sup> AECOM. (April 2022). Technical Note supporting the Hayling Island Coastal Management Strategy Habitats Regulations Assessment – Habitat losses and gains.

<sup>12</sup> Natural England’s consultation response was provided in an email dated 27/05/2022.

<sup>13</sup> Havant Borough Council. (May 2021). Havant Borough Local Plan – Habitats Regulations Assessment. Available at: [https://cdn.havant.gov.uk/public/documents/CD13a%20Havant%20Borough%20Local%20Plan%20Habitat%20Regulations%20Assessment%20\(May%202021\)\\_0.pdf](https://cdn.havant.gov.uk/public/documents/CD13a%20Havant%20Borough%20Local%20Plan%20Habitat%20Regulations%20Assessment%20(May%202021)_0.pdf) [Accessed on the 29/03/2022]

<sup>14</sup> North Solent Shoreline Management Plan. (December 2010). Available at: <https://www.northsolentsmp.co.uk/> [Accessed on the 30/03/2022]

- Solent Waders and Brent Goose Strategy<sup>15</sup> and its associated guidance on mitigation and off-setting requirements<sup>16</sup>;
- The UK Air Pollution Information System ([www.apis.ac.uk](http://www.apis.ac.uk));
- Multi Agency Geographic Information for the Countryside (MAGIC; [www.magic.gov.uk](http://www.magic.gov.uk)) and its links to Marine Protected Area Conservation Advice<sup>17</sup>; and
- Research reports published in the academic literature and available on Google Scholar (cited throughout the report where relevant).

## The Layout of this Report

1.17 Chapter 2 of this report explains the methodology by which this HRA has been carried out, including the four essential tasks (stages) that form part of HRA. Chapter 3 provides detail on the European sites relevant to the HICMS, including an introduction to the sites, a summary of their qualifying habitats / species, Natural England Conservation Objectives and the current threats and pressures relevant to these sites. Detailed background on the main impact pathways identified in relation to the HICMS and European Sites is provided in Chapter 4. Chapter 5 undertakes the Appropriate Assessment of the impact pathways for which LSEs could not be excluded. Chapter 6 provides an appraisal of the derogation tests (No Alternatives, IROPI and compensation) that the HICMS must meet in relation to:

- intertidal habitat loss in the Solent Maritime SAC and the Chichester and Langstone Harbours SPA / Ramsar;
- supralittoral (vegetated shingle) habitat loss in the Solent Maritime SAC; and
- landward supporting habitat loss in the Chichester and Langstone Harbours SPA / Ramsar.

The conclusions and recommendations arising from the HRA process are set out in Chapter 7.

## Quality Assurance

1.18 This report was undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to establishing and maintaining our certification to the international standards BS EN ISO 9001:2008 and 14001:2004 and BS OHSAS 18001:2007. In addition, our IMS requires careful selection and monitoring of the performance of all sub-consultants and contractors.

1.19 All AECOM Ecologists working on this project are members (at the appropriate level) of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct<sup>18</sup>.

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<sup>15</sup> Solent Waders and Brent Goose Steering Group. (2020). Solent Waders and Brent Goose Strategy. 43pp. Available at: <https://solentwbgs.files.wordpress.com/2021/03/solent-waders-brent-goose-strategy-2020.pdf> [Accessed on the 29/03/2022]

<sup>16</sup> Solent Waders and Brent Goose Steering Group. (October 2018). Solent Waders and Brent Goose Strategy – Guidance on Mitigation and Off-setting Requirements. 15pp. Available at: <https://solentwbgs.files.wordpress.com/2021/03/swbgs-mitigation-guidance-oct-2018.pdf> [Accessed on the 29/03/2022]

<sup>17</sup> The Marine Protected Area Conservation Advice packages are hosted online at: <https://defra.maps.arcgis.com/apps/webappviewer/index.html?id=e2bb368f17f1475dbcb3624b33cde076> [Accessed on the 29/07/2022]

<sup>18</sup> Chartered Institute of Ecology and Environmental Management. (February 2022). Code of Professional Conduct. 8pp. Available at: <https://cieem.net/wp-content/uploads/2019/02/Code-of-Professional-Conduct-fEB-2022.pdf> [Accessed on the 29/07/2022]



## 2. Methodology

### Introduction

- 2.1 The HRA has been carried out with reference to the general EC guidance on HRA<sup>19</sup> and that updated by the UK government in February 2021<sup>20</sup>; These have been referred to in undertaking this HRA.
- 2.2 **Figure 3** below outlines the stages of HRA according to current EC guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

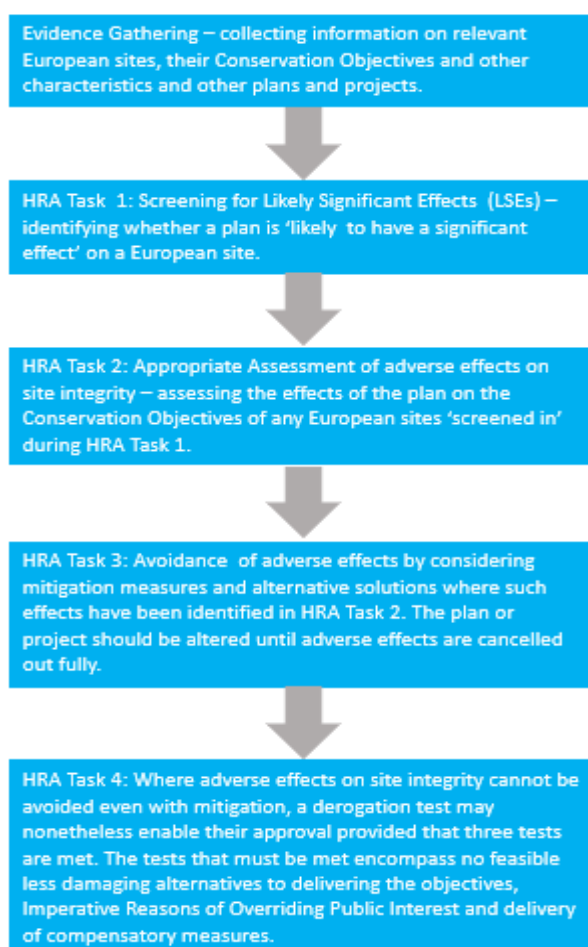


Figure 3: Four Stage Approach to Habitats Regulations Assessment.

### Description of HRA Tasks

#### HRA Task 1 – Screening for Likely Significant Effects (LSEs)

- 2.3 Following evidence gathering, the first stage of any HRA is a LSEs test – essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

<sup>19</sup> European Commission (2021): Assessment of plans and projects in relation to Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive. Available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC1028\(02\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC1028(02)&from=EN) [Accessed on the 29/07/2022]

<sup>20</sup> <https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site>

*"Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"*

- 2.4 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be concluded to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction. This stage was undertaken by Coastal Partners in a separate HRA screening report.

## HRA Task 2 – Appropriate Assessment (AA)

- 2.5 The impact pathways identified in the HRA screening report, for which LSEs could not be excluded, need to be assessed in the next stage of HRA known as AA. Case law has clarified that AA is **not** a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to Appropriate Assessment rather than the screening for LSEs.
- 2.6 By virtue of the fact that it follows the screening process, there is a clear implication that the analysis will be more detailed than undertaken at the previous stage. One of the key considerations during AA is whether there is available mitigation that would entirely address the potential effect. In practice, the AA would take any policies or allocations that could not be dismissed following the high-level screening analysis and assess the potential for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on site integrity (in other words, disruption of the coherent structure and function of the European site(s)).
- 2.7 Also, in 2018 the Holohan ruling<sup>21</sup> was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that *'As regards other habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, ... typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area'* [emphasis added]. This has been considered in relation to the Chichester and Langstone Harbours SPA / Ramsar, which supports mobile overwintering waterfowl and waders that are known to critically depend on supporting habitats (e.g. high-tide roosts, amenity grassland and agricultural fields) beyond the designated site boundary.

## HRA Task 3 – Avoidance and Mitigation

- 2.8 Where necessary, measures are recommended for incorporation into the Plan in order to avoid or mitigate adverse effects on European sites. For example, there is considerable precedent concerning the level of detail that a plan or strategy needs to contain regarding mitigation of the loss of functionally linked habitats. The implication of this precedent is that it is not necessary for all solutions to be fully developed prior to adoption of the document, but that it must contain an adequate strategic policy framework within which these measures can be delivered or be supported by adequate documentation that mitigation can be achieved.
- 2.9 In evaluating significance of impacts and effectiveness of mitigation, AECOM has relied on professional judgement as well as information from previous stakeholder consultations carried out in relation to this project.
- 2.10 When discussing 'mitigation' for a Coastal Management Strategy, one is concerned with the details of the mitigation measures themselves as well as the overarching policy approach. While some Hold the Line policies have been incorporated from the overarching NSSMP, the HICMS actively reviewed and changed, where appropriate, coastal management policies for Hayling Island.

## HRA Task 4 – IROPI / No Alternatives / Compensation

- 2.11 In the circumstances that the impacts of a plan or project on a European site cannot be mitigated, Article 6(4) of the Habitats Directive provides a derogation that enables their approval, provided that three tests are met. These tests must be interpreted strictly, and competent authorities are recommended to undertake early engagement with statutory nature conservation bodies to

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<sup>21</sup> Case C-461/17

ensure that the tests are adequately addressed and documented. The following three tests must be met in full<sup>22 23</sup>:

- No feasible alternative solutions to deliver the objectives of the plan or project exist that would be less damaging;
- IROPI for the plan or project to proceed exist;
- Compensatory measures are secured to ensure that the overall coherence of the structure and function of European sites is maintained.

2.12 The purpose of testing reasonable alternatives is to ensure that there are no feasible alternative ways to deliver the overall objective of the plan / project that would be less damaging to European sites. Alternative scenarios, including the 'Do Nothing' option, must be considered objectively and broadly. This may include appraising different locations, routes, scales, construction methodologies and timings. Alternative solutions are limited to those which deliver the same overall outcome as the original proposal. It is the responsibility of the competent authority to undertake alternatives testing and refuse planning / adoption consent where less damaging alternatives are identified.

2.13 Provided that No Alternatives exist, the competent authority must demonstrate IROPI that justify the plan or project to proceed despite the environmental damages it will cause. Where a European site encompasses priority habitats or species, acceptable IROPI are limited to human health, public safety and beneficial environmental consequences of primary importance. For other European sites IROPI may additionally include those relating to social or economic benefits. Generally, IROPI must meet the key elements of 'imperative', 'overriding' and 'public interest'. While plans or projects may be granted IROPI at all spatial scales, the ones most likely to fulfil the criteria will be those that are in line with national strategic plans or policies (e.g. National Policy Statements and the National Infrastructure Plan).

2.14 If the No Alternatives and IROPI tests are met, a plan or project must provide for adequate compensation (in agreement with statutory nature conservation bodies) to ensure the coherent ecological network of protected sites is safeguarded. In most cases compensatory measures would involve the re-creation of comparable habitat, either as an extension to an existing European site or with the potential to be designated in the future. A range of factors should be considered in identifying compensation, including distance to the affected site, time to full ecological functioning, technical feasibility and the time lag associated with the compensation delivery (i.e. compensation measures should be delivered before the adverse effect occurs).

## Geographical Scope of the HRA

2.15 There are no standard criteria for determining the ultimate physical scope of an HRA. Rather, the source-pathway-receptor model should be used to determine whether there is any potential pathway connecting a coastal management approach to relevant European sites. In relation to the HICMS it was determined at an early stage, and supported in the Screening Report undertaken by Coastal Partners, that two coastal European sites adjoining the island required consideration:

- Chichester and Langstone Harbours SPA / Ramsar; and
- Solent Maritime SAC.

2.16 As highlighted in the introduction, potential impacts of the HICMS on the Solent and Dorset Coast SPA have been excluded, because foraging terns and populations of their fish prey will not be impacted by the approach taken to coastal management on Hayling Island. Generally, it should

<sup>22</sup> A summary of and case studies relating to the three derogation tests is provided in: Department for Environment, Food and Rural Affairs. (August 2012). Habitats Directive: Guidance on the application of article 6(4) – Alternative solutions, imperative reasons of overriding public interest (IROPI) and compensatory measures. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/82647/habitats-directive-iropi-draft-guidance-20120807.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/82647/habitats-directive-iropi-draft-guidance-20120807.pdf) [Accessed on the 29/06/2022]

<sup>23</sup> The UK Government has also published detailed guidance on derogations. Available at: <https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site#derogation> [Accessed on the 29/07/2022]

be noted that the presence of a conceivable impact pathway linking the HICMS to the above European sites does not mean that LSEs necessarily will occur.

## 3. European Sites

### Chichester and Langstone Harbours SPA / Ramsar

#### Introduction

- 3.1 The Chichester and Langstone Harbours SPA / Ramsar forms part of a complex estuarine system on England's south coast. Its inlets and bays are unique in Britain in terms of their hydrographic regime and the complexity of marine / coastal habitats they encompass. The habitat diversity includes extensive areas of intertidal mudflat (with eelgrass *Zostera* spp.), saltmarsh and natural shoreline habitats.
- 3.2 In terms of species diversity, the site supports all four species of cordgrass found in the UK, including the extremely rare small cordgrass *Spartina maritima*. Due to its rich and diverse habitats the Solent complex attracts nationally and internationally significant numbers of migratory and overwintering waterfowl and waders (e.g. Brent geese). The site also sustains important breeding populations of several tern and gull species.

#### SPA Qualifying Features<sup>24</sup>

- 3.3 The Chichester and Langstone Harbours SPA is classified for the following bird species listed under Annex I and Annex II of the Directive 92/43/EEC:

##### **Overwintering (all 5 year peak mean 1982/83 – 1986/87 unless otherwise stated)**

- Northern pintail *Anas acuta* – 323 individuals, representing 1.1% of the GB population<sup>25</sup>
- Northern shoveler *Anas clypeata* – 124 individuals, representing 0.7% of the GB population
- Eurasian teal *Anas crecca* – 2,553 individuals, representing 1% of the north-western Europe population
- Eurasian wigeon *Anas penelope* – 3,947 individuals, representing 0.9% of the GB population (5 year peak mean 2010/11 – 2014/15)
- Ruddy turnstone *Arenaria interpres* – 564 individuals, representing 1.2% of the GB population
- Dark-bellied brent goose *Branta bernicla bernicla* – 17,712 individuals, representing 12% of the western Siberia / Western Europe population
- Sanderling *Calidris alba* – 407 individuals, representing 3.1% of the eastern Atlantic / western & southern Africa wintering population
- Dunlin *Calidris alpina alpina* – 53,977 individuals, representing 2.6% of the northern Siberia / Europe / western Africa population
- Ringed plover *Charadrius hiaticula* – 1,012 individuals, representing 3% of the GB population
- Bar-tailed godwit *Limosa lapponica* – 1,491 individuals, representing up to 3.9% of the GB population)

<sup>24</sup> Available at:

<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9011011&SiteName=chichester&SiteNameDisplay=Chichester%20and%20Langstone%20Harbours%20SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=18&HasCA=1#SiteInfo> [Accessed on the 16/09/2022]

<sup>25</sup> Populations sizes provided are at time of classification of the site.

- Red-breasted merganser *Mergus serrator* – 366 individuals, representing 4.4% of the GB population (5 year peak mean 2010/11 – 2014/15)
- Eurasian curlew *Numenius arquata* – 2,937 individuals, representing 2.1% of the GB population
- Grey plover *Pluvialis squatarola* – 3,271 individuals, representing 3.9% of the eastern Atlantic wintering population
- Common shelduck *Tadorna tadorna* – 4,287 individuals, representing 4% of the north-western Europe population
- Common redshank *Tringa totanus* – 3,417 individuals, representing 1.4% of the eastern Atlantic wintering population

### **Breeding**

- Little tern *Sterna albifrons* – 109 pairs, representing up to 5.7% of the UK breeding population (5 year mean 1982 – 1986)
- Common tern *Sterna hirundo* – 126 pairs, representing up to 1.1% of the UK breeding population (5 year mean 1982 – 1986)
- Sandwich tern *Sterna sandvicensis* – 93 pairs, representing up to 0.7% of the UK breeding population (5 year mean 2011 – 2015)

3.4 Under Article 4.2 of Directive 79/409/EEC the site also qualifies as an SPA due to its internationally important waterbird assemblage, over winter regularly supporting 108,811 birds (5-year peak mean 1982/83 – 1986/87). The following species are included in the assemblage qualification: *Branta bernicla bernicla*, *Tadorna tadorna*, *Anas penelope*, *Anas crecca*, *Anas acuta*, *Anas clypeata*, *Mergus serrator*, *Charadrius hiaticula*, *Pluvialis squatarola*, *Calidris alba*, *Calidris alpina alpina*, *Limosa lapponica*, *Numenius arquata*, *Tringa totanus*, *Arenaria interpres*.

## **Ramsar Qualifying Features<sup>26</sup>**

3.5 The site is classified as a Ramsar for fulfilling the following criteria:

### **Criterion 1**

Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.

### **Criterion 5**

#### **Assemblages of international importance**

##### **Species with peak counts in winter:**

76,480 waterfowl (5 year peak mean 1998/99 – 2002/03)

### **Criterion 6**

#### **Qualifying species / populations (as identified at designation)**

##### **Species with peak counts in spring / autumn:**

- Ringed plover *Charadrius hiaticula* – 853 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/99 – 2002/03)
- Black-tailed godwit *Limosa limosa islandica* – 906 individuals, representing an average of 2.5% of the population (5 year peak mean 1998/99 – 2002/03)

<sup>26</sup> Available at: <https://jncc.gov.uk/jncc-assets/RIS/UK11013.pdf> [Accessed on the 30/03/2022]

- Common redshank *Tringa totanus totanus* – 2,577 individuals, representing an average of 1% of the population (5 year peak mean 1998/99 – 2002/03)

#### Species with peak counts in winter:

- Dark-bellied brent goose *Branta bernicla bernicla* – 12,987 individuals, representing an average of 6% of the population (5 year peak mean 1998/99 – 2002/03)
- Common shelduck *Tadorna tadorna* – 1,468 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/99 – 2002/03)
- Grey plover *Pluvialis squatarola* – 3,043 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/99 – 2002/03)
- Dunlin *Calidris alpina alpina* – 33,436 individuals, representing an average of 2.5% of the population (5 year peak mean 1998/99 – 2002/03)

#### Species / populations identified subsequent to designation for possible future consideration under criterion 6

#### Species regularly supported during the breeding season:

- Little tern *Sterna albifrons albifrons* – 130 apparently occupied nests, representing an average of 1.1% of the breeding population (Seabird 2000 Census)

## SPA Conservation Objectives<sup>27</sup>

- 3.6 With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed above in sections 3.3 and 3.4), and subject to natural change;
- 3.7 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;
- The extent and distribution of the habitats of the qualifying features
  - The structure and function of the habitats of the qualifying features
  - The supporting processes on which the habitats of the qualifying features rely
  - The population of each of the qualifying features, and,
  - The distribution of the qualifying features within the site.

## Threats / Pressures to Site Integrity<sup>28</sup>

- 3.8 Natural England's Site Improvement Plan for the Chichester and Langstone Harbours SPA / Ramsar and other European sites in the Solent, highlights the following threats / pressures to the integrity of the site:
- Public access / disturbance
  - Coastal squeeze
  - Fisheries: Commercial marine and estuarine
  - Water pollution
  - Changes in species distributions
  - Climate change

<sup>27</sup> Available at: <http://publications.naturalengland.org.uk/publication/5789102905491456> [Accessed on the 30/03/2022]

<sup>28</sup> Available at: <http://publications.naturalengland.org.uk/publication/4692013588938752> [Accessed on the 30/03/2022]



- Change to site conditions
- Invasive species
- Direct land take from development
- Biological resource use
- Change in land management
- Inappropriate pest control
- Air pollution: Impact of atmospheric nitrogen deposition
- Hydrological changes
- Direct impact from 3<sup>rd</sup> party
- Extraction: Non-living resources
- Other (Supporting habitats)

## Solent Maritime SAC

### Introduction

- 3.9 The Solent Maritime SAC is a 11,243.12ha large site encompassing a range of broad habitats, including tidal rivers / estuaries / mudflats / sandflats (59%), saltmarsh / salt pastures (23%), marine areas / sea inlets (14%), shingle / sea cliffs (3%), coastal sand dunes (0.5%) and broad-leaved deciduous woodland (5%). The SAC is designated for a range of habitats, including its estuaries and salt meadows features. Being part of the wider Solent, the SAC is part of a major estuarine system that is unique in terms of its hydrographic regime (four tides per day) and the complexity of its marine and estuarine habitats. The mudflats range from low / variable salinity in the upper estuarine reaches to fully marine muds in the Chichester and Langstone Harbours.
- 3.10 The Solent as a whole contains the second largest aggregation of Atlantic salt meadows in south and south-west England. The SAC contains many separate areas of saltmarsh, which are representative of the ungrazed type and include species such as sea purslane *Atriplex portulacoides*, common sea lavender *Limonium vulgare* and thrift *Armeria maritima*. Due to its less impacted condition the SAC supports unusual transitions to freshwater reedswamp, alluvial woodland and coastal grassland. Typical Atlantic salt meadows are still widespread within the SAC despite colonisation with cord-grass *Spartina* spp. Part of the importance of the SAC also relates to its provision of foraging, resting and roosting habitats to qualifying birds of the partially overlapping Chichester and Langstone Harbours SPA / Ramsar.

### Qualifying Features<sup>29</sup>

- 3.11 Annex I habitats that are a primary reason for selection of this site:
- Estuaries
  - *Spartina* swards *Spartinion maritimae*
  - Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- 3.12 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:
- Sandbanks which are slightly covered by sea water all the time
  - Mudflats and sandflats not covered by seawater at low tide

<sup>29</sup> Available at: <https://sac.incc.gov.uk/site/UK0030059> [Accessed on the 30/03/2022]



- Coastal lagoons (\*Priority feature)
- Annual vegetation of drift lines
- Perennial vegetation of stony banks
- *Salicornia* and other annuals colonising mud and sand
- Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”)

3.13 Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Desmoulin’s whorl snail *Vertigo moulinsiana*

3.14 Potential impacts of the HICMS on the Desmoulin’s whorl snail and coastal lagoons features were appraised in the HRA Screening Report undertaken by Coastal Partners. However, no realistic pathways of impact were identified in relation to these features, such that they were screened out from further assessment and this AA.

## Conservation Objectives<sup>30</sup>

3.15 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the ‘Qualifying Features’ listed above), and subject to natural change;

3.16 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

## Threats / Pressures to Site Integrity<sup>31</sup>

3.17 Natural England’s Site Improvement Plan for the Solent Maritime SAC and other European sites in the Solent, highlights the following threats / pressures to the integrity of the site:

- Public access / disturbance
- Coastal squeeze
- Fisheries: Commercial marine and estuarine
- Water pollution
- Changes in species distributions
- Climate change
- Change to site conditions
- Invasive species

<sup>30</sup> Available at: <http://publications.naturalengland.org.uk/publication/5762436174970880> [Accessed on the 30/03/2022]

<sup>31</sup> Available at: <http://publications.naturalengland.org.uk/publication/4692013588938752> [Accessed on the 30/03/2022]

- Direct land take from development
- Biological resource use
- Change in land management
- Inappropriate pest control
- Air pollution: Impact of atmospheric nitrogen deposition
- Hydrological changes
- Direct impact from 3<sup>rd</sup> party
- Extraction: Non-living resources
- Other (Supporting habitats)

## 4. Background to Impact Pathways

### Direct SAC and SPA / Ramsar Habitat Loss – Intertidal (Littoral) and Vegetated Shingle (Supralittoral) Habitat

- 4.1 Coastal squeeze is a well-established process that results in a net contraction and eventual disappearance of intertidal habitats, which may be designated features themselves and / or critical supporting habitats for SPA / Ramsar waders and waterfowl. Specifically, it is affected through measures that hold the line of defence via hard structures, which results in intertidal habitat loss by preventing the landward migration of these habitats in response to sea level rise. The published literature<sup>32</sup> provides the following definition of coastal squeeze: *'the loss of natural habitats or deterioration of their quality arising from anthropogenic structures or actions, preventing the landward transgression of those habitats that would otherwise naturally occur in response to sea level rise in conjunction with other coastal processes. Coastal squeeze affects habitat on the seaward side of existing structures.'* Several modelling studies on the implications of coastal squeeze have been undertaken. For example, provided that no additional space for accommodating sea level rise is provided (e.g. through nature-based coastal management approaches and Managed Realignment), a global loss of coastal wetland up to 30% is forecast to 2100<sup>33</sup>. A study comparing armoured and unarmoured coastal segments determined that defended coasts lacked dry upper beach zones and comprised narrower mid-beach zones. Furthermore, areas with frontline defences were also characterised by lower abundance, biomass and size of upper intertidal macroinvertebrates, and lower abundance and species richness of shorebirds<sup>34</sup>.
- 4.2 Given the increasing density of urban development along coastlines, which interferes with natural adaptive processes of coastal habitats, coastal squeeze is becoming an increasingly important consideration in the HRA process. While being bound under the Habitats and Species Regulations 2017 (as amended), Local Planning Authorities are also legally required to protect important human receptors, including homes, businesses and critical infrastructure (e.g. roads and railway lines). These objectives may be conflicting, which means that in many instances protection of coastal assets cannot be achieved without adverse effects on site integrity. Development plans for which this is the case must meet statutory derogation tests, including IROPI and No Reasonable Alternatives. Additionally, to receive consent for adopting such plans, satisfactory habitat compensation must be delivered that ensures the continued adequate structure and function of that European site.
- 4.3 Calculations of intertidal habitat loss for the Hayling Island frontage were undertaken at the overarching NSSMP level. These calculations are still applicable to the HICMS, which sits at a lower tier in the planning system, except for where there are proposed policy changes between the SMP and the draft HICMS. Any changes in sea level rise projections and implications for intertidal habitat loss will be accounted for in the SMP Refresh process, via an update to the Solent Dynamic Coast Project (SDCP), as confirmed by both the Environment Agency and Natural England. This HRA only recalculates habitat losses and gains where the HICMS encompasses a change in shoreline management approach compared to the SMP. The approach to intertidal habitat loss is further detailed in a technical note (see **Appendix A**) and discussed in Chapter 5.

<sup>32</sup> Environment Agency. (February 2021). Flood and Coastal Erosion Risk Management Research and Development Programme. Available at: <https://www.gov.uk/flood-and-coastal-erosion-risk-management-research-reports/what-is-coastal-squeeze#:~:text=Coastal%20squeeze%20is%20now%20defined,conjunction%20with%20other%20coastal%20processes> [Accessed on the 01/08/2022]

<sup>33</sup> Schuerch M, Spencer T, Temmerman S, Kirwan ML, Wolff C, Lincke D, McOwen CJ, Pickering MD, Reef R, Vafeidis AT, Hinkel J, Nicholls RJ & Brown S. (2018). Future response of global coastal wetlands to sea-level rise. *Nature* **561**: 231-234.

<sup>34</sup> Dugan JE, Hubbard DM, Rodil IF, Revell DL & Schroeter S. (2008). Ecological effects of coastal armoring on sandy beaches. *Marine Ecology* **29**: 160-170.

## Direct SAC Habitat and SPA / Ramsar Supporting Habitat Loss – Subtidal Habitat

- 4.4 The placement of any permanent cross shore structures (e.g. groynes) has the potential to result in the permanent loss of subtidal SAC habitats and SPA / Ramsar supporting habitats. Impacted features may include subtidal sandbanks and associated sub-features, estuarine habitats and shallow coastal waters used by SPA / Ramsar species for foraging. In the context of European sites, any more than trivial direct habitat loss is deemed to have an adverse effect on site integrity since it reduces the extent of habitats that a SAC is designated for and / or SPA / Ramsar qualifying species rely on.
- 4.5 To determine whether a loss can be deemed ‘trivial’, the extent of habitat projected to be lost must be assessed in the context of the remaining extent of that same habitat type. For example, it is not considered that the very loss of a small area of sandbank (e.g. under the footprint of a groyne) in a site comprising thousands of hectares of this habitat would necessarily result in an adverse effect on site integrity, even without considering mitigation. Nonetheless, any direct habitat loss in European sites needs to be adequately appraised in an AA.

## Direct SPA / Ramsar Habitat Loss – Landward (Coastal Grazing Marsh and Freshwater) Habitat

- 4.6 While the Chichester and Langstone Harbours SPA / Ramsar primarily encompasses the two estuarine basins and associated intertidal mudflats / saltmarsh, it is noted that areas of landward habitats (i.e. areas behind the existing coastal defence alignment) are also included in the European site. These landward habitats, primarily located on the eastern side of Hayling Island, comprise coastal grazing marsh, wet grassland and reedbeds, and would have been included in the SPA / Ramsar due to their known importance to the qualifying bird species. Importantly, these landward habitats in the SPA / Ramsar lie landward of the existing line of defence, meaning that they are protected from flooding and erosion under the current management approach.
- 4.7 Revising the management approach to Managed Realignment and Do Nothing along these stretches of coastline could lead to the long-term loss of coastal grazing marsh and freshwater habitats in the SPA / Ramsar across the epochs covered by the HICMS. Given that this would constitute a net loss of designated supporting habitat, this element of the HICMS would need to satisfy the IROPI and No Alternatives derogation tests as well as providing habitat compensation. It is to be noted that the loss of wader and wildfowl supporting habitats outside the SPA / Ramsar boundary is discussed in the next section. Notwithstanding the different legal requirements and terminology (i.e. compensation vs mitigation), compensation for the loss of landward habitats within the SPA / Ramsar is likely to involve similar off-setting requirements to those identified in the SWBGS for mitigating the loss of functionally linked habitat.

## Loss of Functionally Linked Habitat

- 4.8 The Chichester and Langstone Harbours SPA / Ramsar, and the other estuarine / coastal European sites in the wider Solent area, are designated for their mobile wader and wildfowl species that routinely exploit supporting habitats (also referred to as functionally linked habitats) beyond established site boundaries. Whilst the boundary of a European site will typically be drawn to include key supporting habitats for a qualifying species, this is not the case for species that are particularly mobile. Some types of birds (e.g. waterfowl, sea birds) have considerable mobility, implying that it is impossible to designate all habitats that may conceivably be used by a species. A Natural England report defines functionally linked habitat as ‘*supporting habitat in areas beyond the boundary of a SAC or SPA which are connected with or ‘functionally linked’ to the life and reproduction of a population for which a site has been designated or classified.*’ The implication of this definition is that such off-site habitats must be taken account in HRAs, which must determine how critical a particular area is for maintaining or restoring favourable conservation status of a species.
- 4.9 Given that terrestrial supporting habitats typically have clear demarcations and the mobility of many bird species is well researched, the identification of functionally linked habitats is usually

relatively straightforward. In some cases, particularly where ecological knowledge is less comprehensive, data from local record centres will need to be obtained or site surveys undertaken. For several regions in the UK, Natural England and other environmental stakeholders have developed a detailed evidence base for off-site habitat use, which enables development plans to be supported by adequate mitigation using best available scientific evidence. For example, Bowland Ecology mapped habitats that are functionally linked to SSSIs in north-west England using a variety of data sources, including Wetland Bird Survey (WeBS) counts, British Trust for Ornithology (BTO) BirdTrack data, Lancaster and District Birdwatching Society (LDBWS) maps and data held by the Lancashire County Bird Recorder. In the Solent, Local Planning Authorities have collaborated to identify and protect terrestrial sites used by SPA / Ramsar species. This process led to the adoption of the non-statutory SWBGS in 2010, followed by a significant update to the strategy in 2019<sup>35</sup>. The SWBGS provides a framework in which to strategically assess development plans in the Solent, including any mitigation requirements<sup>36</sup>.

- 4.10 The flood and erosion risk modelling methodology developed as part of the HICMS was utilised to determine the loss of functionally linked habitats over the 100 years covered by the strategy. Habitat loss may occur due to a combination of erosion and flooding processes. Permanent loss due to erosion was assumed to occur where predicted erosion intersects with relevant SWBGS supporting habitats. Loss associated with flooding for epoch 1 (2042), epoch 2 (2072) and epoch 3 (2122) was assumed to occur where 1 in 2 year flood extents intersect with relevant SWBGS supporting habitats, noting that these habitats would still be available intermittently.
- 4.11 While it is noted that the loss of functionally linked habitats represents across the entire timeframe covered by the HICMS, the focus of this HRA is on epoch 1. There are considerable uncertainties regarding the modelling of habitat loss in epochs 2 and 3, including changes in sea level rise projections and usage of supporting habitats by SPA / Ramsar birds. For example, new parcels of supporting habitat may emerge, and others could be abandoned due to a range of environmental factors. Potential functionally linked habitat loss will be assessed in more detail (e.g. through more in-depth flood risk modelling) at the planning application level. The analysis presented in this HRA is proportionate to the level of detail available at the strategy level.
- 4.12 Overall, coastal management is confronted with the unique challenge of compensating for coastal squeeze while also protecting terrestrial functionally linked habitats. Coastal squeeze is primarily compensated for by realigning coastal defences and / or allowing existing defences to fail, interventions that simultaneously put landward supporting habitats at risk. In many instances, a trade-off between these impact pathways is inevitable and it needs to be established whether it is more feasible to recreate intertidal habitats or replace terrestrial supporting habitats.

## Changes to coastal hydrogeomorphic processes (sediment transport and accretion / erosion patterns)

- 4.13 Coastal management schemes that involve the construction of intertidal or subtidal barriers, especially cross-shore structures such as groynes, have the potential to affect hydrogeomorphic processes, including water flows, wave exposure, sediment transport and accretion / erosion patterns. Importantly, no large offshore breakwaters and harbour-wide flood barriers / barrages with the potential to significantly impact the emergence regime are included within the HICMS Leading Options.
- 4.14 Hard structures (e.g. seawalls and groynes) are often constructed in the coastal environment to counteract erosion in areas that are of importance for humans, such as those encompassing critical infrastructure and beaches. They also help prevent further sediment accretion in naturally sediment-rich areas, such as inlets and estuaries. Preventing sediment transport exposes downdrift habitats to an increased risk of erosion that could lead to their disappearance, which is

<sup>35</sup> Solent Waders and Brent Goose Steering Group. (2020). Solent Waders and Brent Goose Strategy. 43pp. Available at: <https://solentwbgs.files.wordpress.com/2021/03/solent-waders-brent-goose-strategy-2020.pdf> [Available at: 27/06/2022]

<sup>36</sup> Solent Waders and Brent Goose Steering Group (October 2018). Solent Waders and Brent Goose Strategy – Guidance on mitigation and off-setting requirements. 15pp. Available at: <https://solentwbgs.files.wordpress.com/2021/03/swbgs-mitigation-guidance-oct-2018.pdf> [Available at: 27/06/2022]

important where downdrift areas encompass designated habitats or supporting habitats for SPA / Ramsar birds. Conversely, hard structures also lead to the accumulation of sediment on the side where the current comes from, which has been linked to declines in the abundance of intertidal and benthic invertebrates<sup>37</sup>, an important foraging resource for many birds.

- 4.15 Seawalls and rock revetments, while protecting inland property from flooding, exacerbate erosion of seaward beaches and intertidal habitats because they reflect wave energy outwards. Overall, coastal management structures hinder the natural evolution of the coastline with potential long-term consequences in the distribution of SAC habitats and supporting habitats / foraging resources for SPA / Ramsar waders and waterfowl.

## Recreational Disturbance to SPA / Ramsar and SAC features

- 4.16 There is concern over the cumulative impacts of recreation on key nature conservation sites in the UK, as most sites must fulfill conservation objectives while also providing recreational opportunity. All wildlife is sensitive to disturbance from recreational activities to varying degrees. One of the main factors in determining the extent of disturbance, aside from the type of activity undertaken and the ecological receptor that is impacted, is the number of people frequenting a site. Many studies have demonstrated compelling links between housing development, access levels and negative impacts in European sites<sup>38 39</sup>.
- 4.17 The potential for negative impacts of disturbance on overwintering birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding<sup>40</sup>. Therefore, disturbance risks increasing energetic expenditure of birds while reducing their energetic intake, which can adversely affect their 'condition' and ultimately survival. Additionally, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they then must sustain a greater number of birds<sup>41</sup>. Moreover, regarding breeding birds, the higher the proportion of time that is spent away from nests, the more likely it is that eggs will cool and the more vulnerable they, or any nestlings, are to predators. Recreational effects on ground-nesting birds are particularly severe, with many studies concluding that urban sites support lower densities of key species, such as stone curlew and nightjar<sup>42 43</sup>.
- 4.18 Several factors (e.g. bird species, seasonality, type of recreational activity) may have pronounced impacts on the magnitude and nature of disturbance. Recreational disturbance in winter can be more impactful because food shortages make birds more vulnerable at this time of year. In contrast, there are often fewer recreational users in the winter months and some effects of disturbance may be reduced because birds are not breeding. Evidence in the literature suggests that the magnitude of disturbance clearly differs between different types of recreational activities. For example, dog walking leads to a significantly higher reduction in bird diversity and abundance compared to hiking<sup>44</sup>. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers<sup>45</sup>. Furthermore, differences in on-site route lengths and usage patterns likely imply that key spatial and temporal parameters (such as the area of a site potentially impacted and the frequency of

<sup>37</sup> Martin D, Bertasi F, Colangelo MA, de Vries MF, Frost M, Hawkins SJ, Macpherson E, Moschella PS, Satta MP, Thompson RC & Ceccherelli VU. (2005). Ecological impact of coastal defence structures on sediment and mobile fauna: Evaluating and forecasting consequences of unavoidable modifications of native habitats. *Coastal Engineering* **52**: 1027-1051.

<sup>38</sup> Liley D, Clarke RT, Mallord JW, Bullock JM. (2006). The effect of urban development and human disturbance on the distribution and abundance of nightjars on the Thames Basin and Dorset Heaths. Footprint Ecology report for Natural England.

<sup>39</sup> Liley D, Clarke RT, Underhill-Day J, Tyldesley DT. (2006). Evidence to support the Appropriate Assessment of development plans and projects in south-east Dorset. Footprint Ecology report for Dorset County Council.

<sup>40</sup> Riddington R. (1996). The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* **43**:269-279.

<sup>41</sup> Gill JA, Sutherland WJ & Norris K. (1998). The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* **12**: 67-72.

<sup>42</sup> Clarke RT, Liley D, Sharp JM & Green RE. (2013). Building development and roads: Implications for the distribution of stone curlews across the Brecks. *PLOS ONE*. doi:10.1371/journal.pone.

<sup>43</sup> Liley D & Clarke RT. (2003). The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England. *Biological Conservation* **114**: 219-230.

<sup>44</sup> Banks PB, Bryant JY. (2007). Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters* **3**: 14pp.

<sup>45</sup> Miller SG, Knight RL, Miller CK. (2001). Wildlife responses to pedestrians and dogs. *Wildlife Society Bulletin* **29**: 124-132.



disturbance) will also differ between recreational activities. This suggests that activity type is a factor that should be taken into account in HRAs.

- 4.19 SAC habitats like estuaries, sandflats and mudflats, and subtidal sandbanks can also be negatively impacted by recreational activities, particularly from water-based activities. For example, powerboating, non-motorised watercraft and sailing can lead to the disturbance and / or abrasion of the seabed. This risk is particularly high where mooring or anchoring of boats is taking place and may lead to long-term changes in the physical characteristics of the seafloor. Impacts on SAC habitats (e.g. annual vegetation of drift lines) may also arise from recreational activities undertaken in the intertidal and supralittoral zones, such as walking, dog walking and horse riding. In the Site Improvement Plan (SIP) for the Solent<sup>46</sup>, which covers the Solent Maritime SAC, Natural England advise that further research into the impacts of recreational activities on annual vegetation of drift lines and the perennial vegetation of stony banks is needed. Additionally, Natural England's site condition assessment for the SAC<sup>47</sup> highlights that both 'mudflats and sandflats not covered by seawater at low tide' and 'sandbanks which are slightly covered by seawater all the time' show signs of continued abrasion from bait digging, trampling and mooring, which are putting these features at risk.
- 4.20 Unlike the development plans of Local Planning Authorities, the HICMS does not propose residential growth and thus will not increase the overall visitor footfall and recreational burden in the Chichester and Langstone Harbours SPA / Ramsar and Solent Maritime SAC. However, coastal management approaches have the potential to affect the distribution of recreational pressure by altering or re-routing public and permissive footpaths. For example, improvements to existing footpaths (e.g. widening or resurfacing) could make them more attractive and increase overall usage. Furthermore, the re-routing of public footpaths may expose previously undisturbed areas of a designated site to visual, acoustic or trampling disturbance. The HICMS encompasses only one proposal with the potential to reshape recreational pressure across Hayling Island, which is the potential relocation of sections of the Hayling Island Billy Trail (HIBT) further inland from its current trajectory along the western side of the island, where it is at continued risk from erosion<sup>48</sup>. While it is recognised that moving the HIBT inland would reduce the potential for direct disturbance to the Chichester and Langstone Harbours SPA / Ramsar and Solent Maritime SAC, it may direct visitors closer to recognised supporting sites identified in the SWBGS or refuge areas identified in the Havant Borough Local Plan.

## Erosion, flooding and disturbance of coastal landfill sites

- 4.21 Across England and Wales there are more than 20,000 historic landfill sites that pre-date modern waste management technologies. Recent research funded by the Environment Agency indicates that more than 1,200 of these sites are at risk of tidal flooding and coastal erosion, with one in ten potentially eroding by 2050 under current sea level rise projections. It is estimated that this places 30% of England's protected coastline at risk of contamination<sup>49</sup>. On undefended shorelines, erosion is mediated by wave action during storms and spring tides, causing the potential direct release of waste materials to the foreshore and, subsequently, to the marine environment. Alternatively, waste material can be washed into coastal waters by overtopping waves (where defences are not raised in line with sea level rise) or through breaches in frontline defences<sup>50</sup>. The precise risk that an eroding landfill site represents to ecological receptors depends on a wide range of factors, including geology, topography, distance from the coastline, energy of wave action and the types of waste stored on-site. Erosion can lead to the release of a wide range of toxic and non-toxic pollutants into the marine environment, including heavy

<sup>46</sup> Available at: <http://publications.naturalengland.org.uk/publication/4692013588938752> [Accessed on the 01/08/2022]

<sup>47</sup> Available at:

[http://www.solentems.org.uk/sems/Condition\\_assessments/Natural\\_England\\_Condition%20Assessment\\_Summary\\_Report\\_for\\_Solent\\_Maritime\\_SAC.PDF](http://www.solentems.org.uk/sems/Condition_assessments/Natural_England_Condition%20Assessment_Summary_Report_for_Solent_Maritime_SAC.PDF) [Accessed on the 01/08/2022]

<sup>48</sup> It is noted that the Leading Option for ODU 14 (Newtown to Stoke) on page 92 of the OAR states that this approach is 'unlikely to be supported by the wider community. However, there is no economic justification to undertake any other option.' On this basis, the relocation of the HIBT is appraised here under the precautionary approach.

<sup>49</sup> The figures from this research are available online at: <https://www.qmul.ac.uk/geog/research/featured-research/-eroding-our-future-pollution-from-historic-landfills-threatens-our-coastlines/> [Accessed on the 28/06/2022]

<sup>50</sup> Brand JH, Spencer KL, O'Shea FT & Lindsay JE. (2017). Potential pollution risks of historic landfills on low-lying coasts and estuaries. *WIREs Water* 5: 1-12.

metals (e.g. mercury, arsenic and cadmium) and breakdown products of oils, fuels, paints, solvents, hydrocarbons and organics.

- 4.22 Coastal management strategies, such as the HICMS, have the potential to facilitate erosion or flooding of coastal landfill sites by adopting Managed Realignment (setting back flood defences) and Do Nothing (allowing existing defences to fail or not introducing hard defences where a landfill site is at risk of future erosion) approaches. Furthermore, landfill sites may be subjected to future erosion risk where the standard of protection (both in terms of height and quality maintenance) is allowed to diminish over time. Conversely, by adopting a 'Hold the Line' approach, management approaches can have a positive impact that prevents the erosion of landward coastal landfill sites. Published guidance on the sustainable management of landfill sites along low-lying and eroding coastlines is available<sup>51</sup>, which aims at the preservation of the coastal environment and associated ecosystems.

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<sup>51</sup> Cooper NJ, Bower G, Tyson R, Flikweert JJ, Rayner S & Hallas A. (2013). Guidance on the management of landfill sites and land contamination on eroding or low-lying coastlines. 199pp.



## 5. Appropriate Assessment

### Direct SAC and SPA / Ramsar Habitat Loss and Gain – Intertidal (Littoral) and Supralittoral Habitat

5.1 The HRA screening of the HICMS produced by Coastal Partners identified that Leading Options which involve a 'Hold the Line' approach by establishing a hard structure, have the potential to result in the loss of seaward habitats due to coastal squeeze. This process prevents the landward transgression of habitats in response to climate change and resulting sea level rise. Over time, unmitigated coastal squeeze would inevitably lead to the cumulative loss of designated habitats (in the case of the Solent Maritime SAC and Chichester & Langstone Harbours Ramsar) and supporting habitats (in the case of the Chichester & Langstone Harbours SPA / Ramsar). In the HRA screening, the following habitats were identified to be at risk from coastal squeeze:

- Mudflats and sandflats – including associated sub-features
- Saltmarsh – *Salicornia* and other annuals colonising mud and sand, *Spartina* swards and Atlantic salt meadows
- Vegetated shingle – annual vegetation of drift lines and perennial vegetation of stony banks
- Non-vegetated shingle banks and spits used by SPA / Ramsar breeding birds for nesting and non-breeding birds for high-tide roosting

5.2 Leading Options for management approaches in the HICMS are now available for the different ODUs covering Hayling Island, as set out in the Draft Strategy document. In the majority of ODUs some form of 'Hold the Line' approach will be implemented, including new frontline defences and setback flood defences / embankments. Mitigating flood and erosion risk by employing hard structures will by definition prevent the landward migration of intertidal habitats. However, in some ODUs (e.g. OD 1, ODU 3, ODU 5) the flood defence structures will be constructed inland from the existing structures that are approaching the end of their life cycle. This will offset at least some of the habitats projected to be lost due to the implementation of the HICMS. A calculation of the overall loss of littoral habitats involves the projected habitat losses due to coastal squeeze, the footprint of defence structures themselves, as far as they can be known at the HICMS level, and any habitat gains obtained by adopting Do Nothing and / or Managed Realignment. The quantification of habitat loss encompasses the entire 100-year period covered by the HICMS. Before discussing the calculations, it is necessary to discuss the context set by the NSSMP and its habitat loss calculations.

### North Solent Shoreline Management Plan, Solent Dynamic Coast Project and Solent and South Downs Regional Habitat Compensation Programme

5.3 An assessment of intertidal habitat losses due to coastal squeeze was undertaken for the NSSMP (spanning the years between 2005 and 2105), which is the overarching management plan for coastal flood and erosion risk that covers the Hayling Island frontage. Part of the Solent Dynamic Coast Project (SDCP) analysed historical aerial photography to understand saltmarsh change between the 1940s and 2008 and project future losses. The study also quantified the extent of intertidal saltmarsh and mudflat losses and gains as a result of the SMP policies, accounting for Environment Agency 2003 sea level rise projections of 6mm per year. A theoretical GIS approach using remote sensing technology (i.e. LiDAR) and tidal elevations was applied to determine the expected area of saltmarsh and mudflat coverage, thereby quantifying intertidal habitat losses and identifying suitable locations for future habitat creation for the SMP epochs (2005 – 2025, 2025 – 2055 and 2055 – 2105). The findings of the SDCP informed the AA of the NSSMP, which concluded that adverse effects on the Solent's European sites could not be avoided and habitat compensation needed to be provided.

5.4 To ensure the delivery of compensatory habitats and allow the NSSMP to be adopted, the Solent and South Downs HCRP was developed. The HCRP was designed to facilitate the strategic identification of areas for the delivery of compensation. While the HCRP reviewed the NSSMP AA calculations of intertidal habitat loss and potential intertidal habitat creation, the SDCP calculations were not updated even though new sea level rise projections and LiDAR data were available. Essentially this is due to the changes in sea level rise projections and topography being marginal, and well within the error margin of the LiDAR data<sup>52 53</sup>. Overall, it has been determined that the SDCP habitat calculations are still applicable for providing habitat compensation for coastal management activities until such time as a comprehensive recalculation is undertaken at the NSSMP level. An update of the SDCP calculations will be undertaken at the strategic level as part of future SMP Refresh work to allow for accurate and representative findings.

## Hayling Island Coastal Management Strategy

5.5 As discussed in the previous section and on the basis of the same rationale as for the HCRP, intertidal habitat loss calculations are not being redone for the HICMS. This allows the HICMS and its HRA requirements to align with the overarching NSSMP and its corresponding HRA. Effectively, this means that the HCRP baseline targets and habitat compensation delivery programme discussed and identified in the NSSMP HRA still apply. The need for a refresh of the calculations at the SMP level arises purely from a change in sea level rise projections rather than because of any difference between the HICMS and the NSSMP (except for where there are proposed changes in policy at the Strategy level as set out in **Section 5.6** below). The overall approach to calculating intertidal habitat losses and gains (see technical note in **Appendix A**) has been agreed to by NE in a consultation response (see **Appendix B**).

5.6 However, where the HICMS proposes changes to NSSMP policies, these do require consideration at the HICMS level. Therefore, using the same theoretical GIS modelling approach that was employed for the SDCP and NSSMP AA, this HRA recalculates intertidal habitat compensation provision (and associated landward habitat losses) in the relevant ODUs for the years 2025, 2055 and 2105 to align with the strategy epochs. The NSSMP AA, and therefore the HICMS intertidal habitat changes, assume a sea level rise of 6mm/yr (EA, 2003) as they are based on the original SDCP calculations<sup>54</sup>. **Table 2** presents the results.

**Table 2: Extent of intertidal habitat created due to changes in management approaches from Hold the Line (at the NSSMP level) to Managed Realignment (at HICMS level).**

Option Development Unit (ODU)	Intertidal Habitat Type	Epoch	Amount Created (ha)
ODU 1B – Hayling Bridge to Northney Farm	Saltmarsh	1 (2005 – 2025)	0.51
		2 (2026 – 2055)	0.05
		3 (2056 – 2105)	0.02
	Mudflat	1	0.19
		2	0
		3	0
ODU 3 – Northney Farm to Chichester Road	Saltmarsh	1	0.95
		2	0.08
		3	0.03
	Mudflat	1	0
		2	0

<sup>52</sup> Eastern Solent Coastal Partnership. (June 2018). Solent and South Downs Regional Habitat Compensation Programme: Annual Review Report 2017. 70pp. Available at: <https://southerncoastalgroup-scopac.org.uk/wp-content/uploads/2019/05/SSD-RHCP-Strategic-Update-Report-2017-Final-with-appendices-compressed.pdf> [Accessed on the 02/08/2022]

<sup>53</sup> Eastern Solent Coastal Partnership. (February 2020). Solent and South Downs Regional Habitat Compensation Programme: Annual Review Report 2018. 44pp. Available at: <https://southerncoastalgroup-scopac.org.uk/wp-content/uploads/2020/02/SSD-RHCP-Annual-Review-Report-2018.pdf> [Accessed on the 02/08/2022]

<sup>54</sup> It is to be noted that UKCP18 sea level rise predictions are used to refine intertidal habitat losses and gains at the scheme-level. The SSD HCRP is also currently preparing a funding bid to undertake a strategic update to the SDCP calculations at the NSSMP level to reflect UKCP18 sea level rise predictions.

Option Development Unit (ODU)	Intertidal Habitat Type	Epoch	Amount Created (ha)
		3	0
ODU 5B – Mill Rythe Junior School to Salterns Lane	Saltmarsh	1	14.79
		2	-2.77 <sup>55</sup>
		3	-5.29
	Mudflat	1	25.09
		2	3.50
		3	6.36
All ODUs	Total Saltmarsh	All Epochs	8.37
	Total Mudflat		35.14

- 5.7 **Table 2** provides a summary of the amount of additional intertidal saltmarsh and mudflat created as a result of the HICMS (compared to the NSSMP AA). Overall, these represent improvements regarding coastal squeeze and intertidal habitat creation. For example, in two ODUs at Northney and Tournerbury (along approx. 3.6km of frontage), the HICMS revises the policy from 'Hold the Line' to 'Managed Realignment' which would increase intertidal habitat creation compared to the NSSMP AA predictions. **Table 2** highlights the benefit of the proposed policy changes in ODU 1, ODU 3 and ODU 5 for the mitigation of coastal squeeze. Of particular note in this regard is the projected amount of saltmarsh created in ODU 3 (1.06ha across all epochs) and ODU 5 (6.73ha across all epochs). Under favourable conditions, saltmarsh develops over time, depending on factors such as topography, disturbance and plant colonisation (e.g. samphire, cord-grasses, sea purslane and sea lavender). This habitat is of critical importance in sustaining overwintering SPA / Ramsar birds, which feed on small invertebrates, crustaceans and its flora (e.g. *Salicornia europaea*). Saltmarshes are under threat from a wide range of anthropogenic pressures, including erosion, pollution, recreation activities in the intertidal zone and development.
- 5.8 Overall, the Leading Options in the HICMS will result in the creation of 8.37ha of saltmarsh and 35.14ha of mudflat over all epochs, representing a significant positive overall change from the NSSMP. Given that additional intertidal habitat will be created, no further intertidal habitat compensation in addition to that identified as part of the NSSMP consenting process will be required. Adverse effects of the HICMS on the integrity of Chichester and Langstone Harbours SPA / Ramsar and Solent Maritime SAC will arise, but only due to the policy approaches already approved at the SMP level for which the derogation tests (No Alternatives and IROPI) have been met and adequate compensation secured, or (for later epochs) commitments to deliver compensation made via the Solent and South Downs HCRP. Given that additional intertidal habitat will be gained (reducing the impact of coastal squeeze), the only management changes at the HICMS level are positive for intertidal habitat features of the European sites.
- 5.9 The Solent Maritime SAC is also designated for two types of vegetated shingle habitats, including annual vegetation of drift lines (unstable habitats at or above the mean high-water spring tide that are subject to periodic removal of the surface) and perennial vegetation of stony banks (more permanent communities above the high-tide limit). In the case of Hayling Island, particularly along the open coast on the south of the island, much of this habitat lies outside the SAC boundary and its loss is not directly relevant to HRA. However, there are small areas of vegetated shingle that form part of the SAC designation and may be squeezed by future Hold the Line approaches.
- 5.10 Therefore, the potential future loss of vegetated shingle was calculated for all ODUs where designated vegetated shingle is present seaward of existing coastal defences and a Hold the Line approach is identified in the HICMS. Because no single data source reliably covers the entirety of Hayling Island, the distribution of vegetated shingle was mapped using several data sources, including mapping from Coastal Partners (2016), Natural England (2013), Coastal Channel Observatory (CCO; 2019 – 2020) and Priority Habitats Inventory (PHI; 2012 – 2013). A

<sup>55</sup> Due to continuing sea level rise, some of the saltmarsh created in epoch 1 will be replaced by mudflats in epochs 2 and 3. However, it should be noted that the HICMS will nonetheless result in the net creation of 9.07ha of saltmarsh across all three epochs and ODUs.

composite vegetated shingle shapefile was created, which was sense-checked by Coastal Partners' ecologists using their local knowledge of the area. The mapping data used have different levels of confidence and it was decided to exclude historic low confidence (not ground truthed) vegetated shingle data along ODU 8S as this area has been accurately mapped more recently by Coastal Partners for the Hayling Beach Management Plan. The merged habitat layer was then clipped to remove any areas outside the Solent Maritime SAC. Where vegetated shingle adjoins a Do Nothing or Managed Realignment policy, it was assumed that the coastline would erode over time, allowing the vegetated shingle to migrate landward. No loss is anticipated in the relevant ODUs. Vegetated shingle adjacent to an area with a Hold the Line policy was identified at risk of being lost.

- 5.11 The modelling approach estimated the amount of vegetated shingle loss for the 100-year HICMS period by identifying the extent of habitat inundated by the 1 in 200 year extreme water level. Sea level rise predictions were taken from the East Solent Hayling Island modelling (on which management approaches in the HICMS are based), which uses an undefended model simulation without wave overtopping. The 1 in 200 year extreme water level was used as it is the scenario that most closely matches the projected water level of the Highest Astronomical Tide (HAT) in 100 years, the end of the strategy period. While this match is not exact, it is the best available existing modelling scenario. In reality, vegetated shingle is a dynamic habitat that is shaped by numerous coastal processes, which are not simulated in the model (e.g. shingle mobility). However, within the limitations of the available data, the approach chosen provides the best approximation of the amount of vegetated shingle lost due to implementation of the HICMS.
- 5.12 Overall, loss of qualifying vegetated shingle is projected for five ODUs for which a Hold the Line approach is proposed (see **Table 3**). Projected losses of vegetated shingle are depicted graphically in **Figure 4 to Figure 7**. The biggest loss is predicted for ODU 15 (1.33ha; **Figure 7**) whereas only relatively little vegetated shingle will be lost in ODU 11 (0.03ha; **Figure 6**). The calculations indicate that the HICMS will result in a cumulative loss of 2.62ha of vegetated shingle over the 100 years of the strategy. Natural England's Supplementary Advice on Conservation Objectives (SACO)<sup>56</sup> specify that at the time of designation the Solent Maritime SAC had a combined extent of vegetated shingle (i.e. annual vegetation of drift lines and perennial vegetation of stony banks) of 34.29ha. This means that Hold the Line approaches in the HICMS would result in a 8% loss of this habitat type, conflicting with the SACO target of maintaining the total extent of vegetated shingle within the SAC. It should be noted that given the absence of good quality mapping of vegetated shingle across the entire Solent Maritime SAC the figure given in the SACO may well be an underestimate. Nonetheless, it is used here to be precautionary.

**Table 3: Projected loss of vegetated shingle habitat in different ODUs due to Hold the Line management approaches set out in the HICMS.**

ODU	Area of vegetated shingle habitat loss (ha)
8	1.02
10	0.15
11	0.03
13	0.09
15	1.33
<b>Total</b>	<b>2.62</b>

<sup>56</sup> Available at:

<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030059&SiteName=&SiteNameDisplay=Solent+Maritime+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=0> [Accessed on the 20/02/2023]



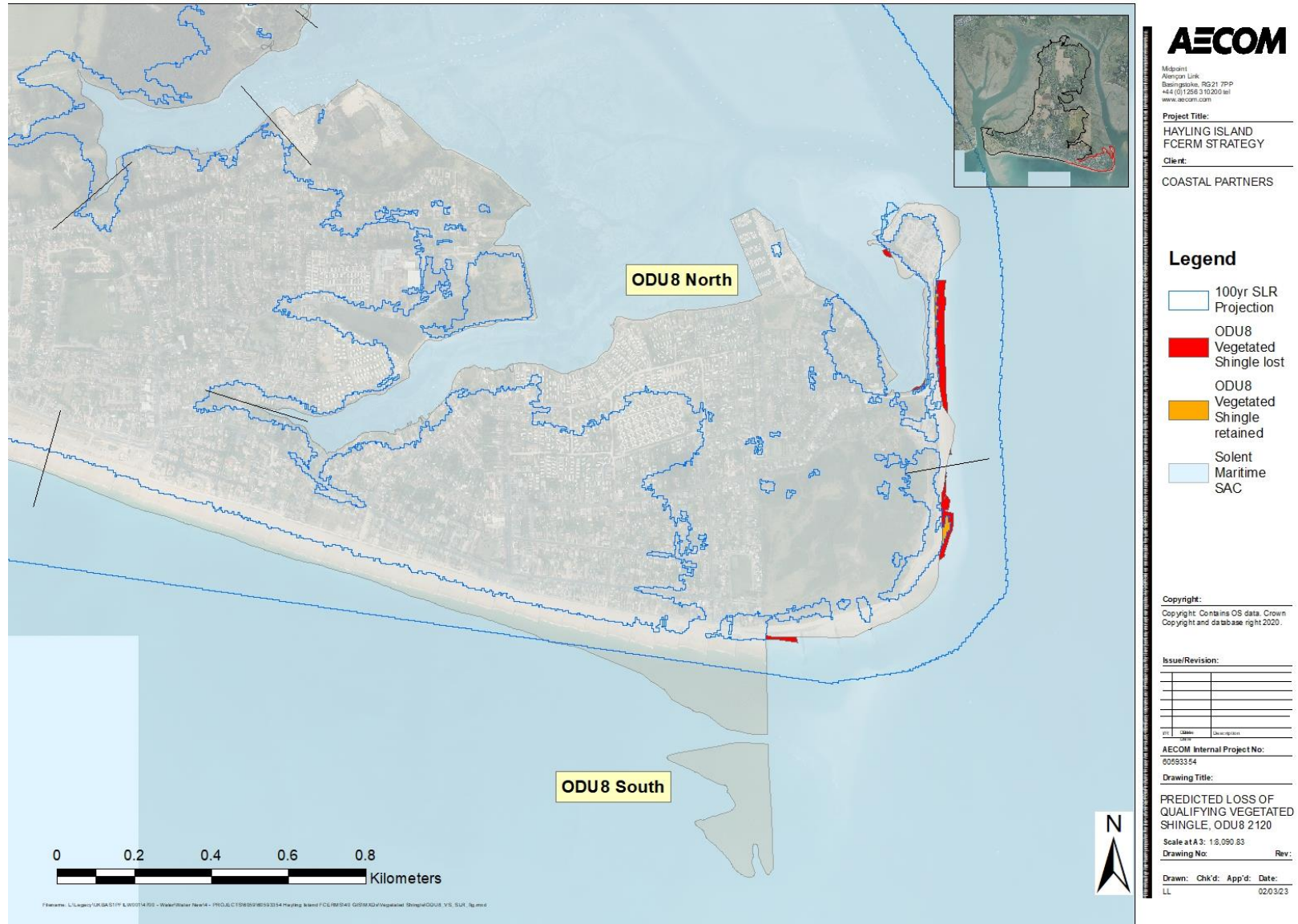


Figure 4: Predicted loss of vegetated shingle in ODU 8 due to a Hold the Line policy approach in the HICMS.

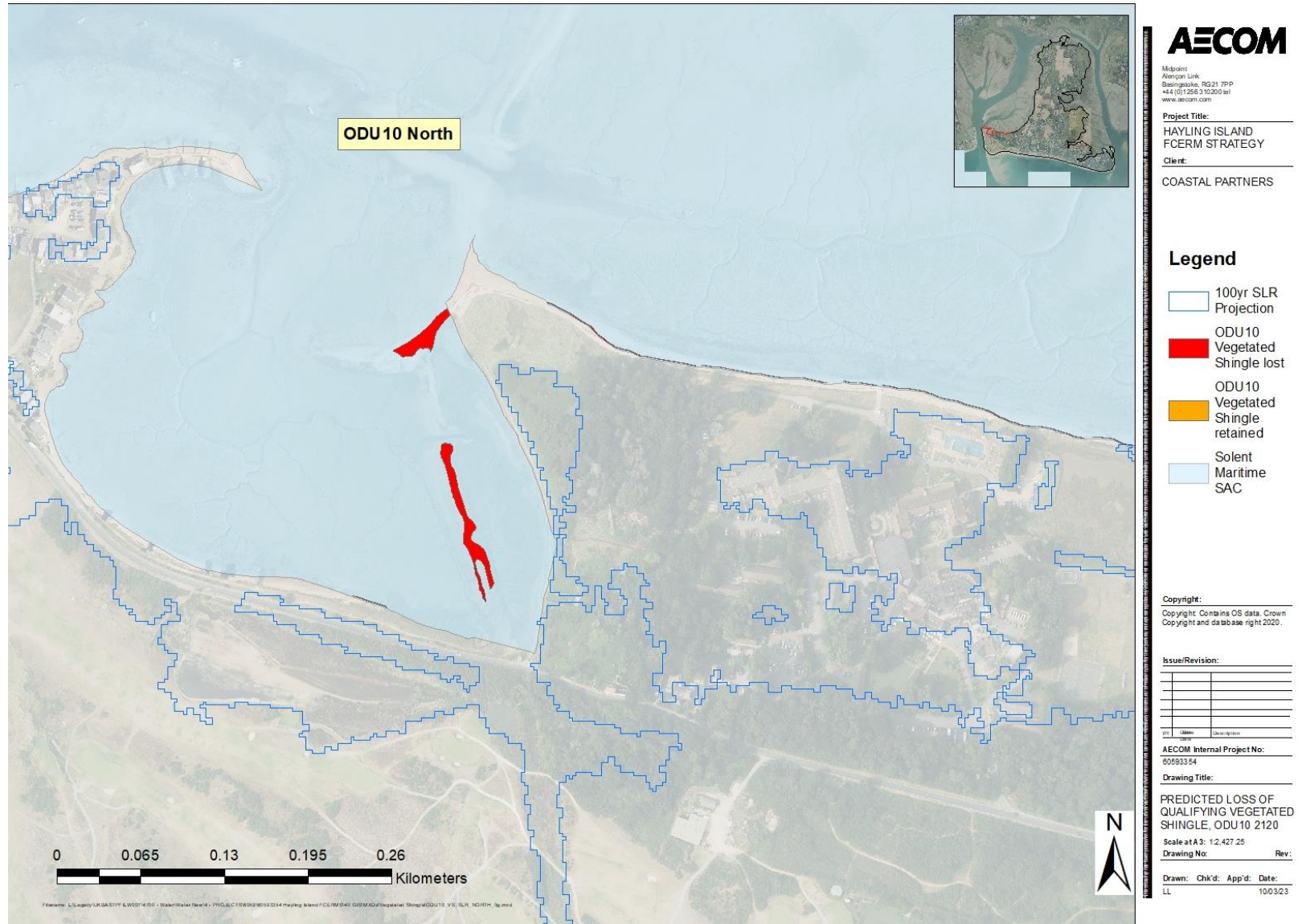


Figure 5: Predicted loss of vegetated shingle in ODU 10N due to a Hold the Line policy approach in the HICMS.



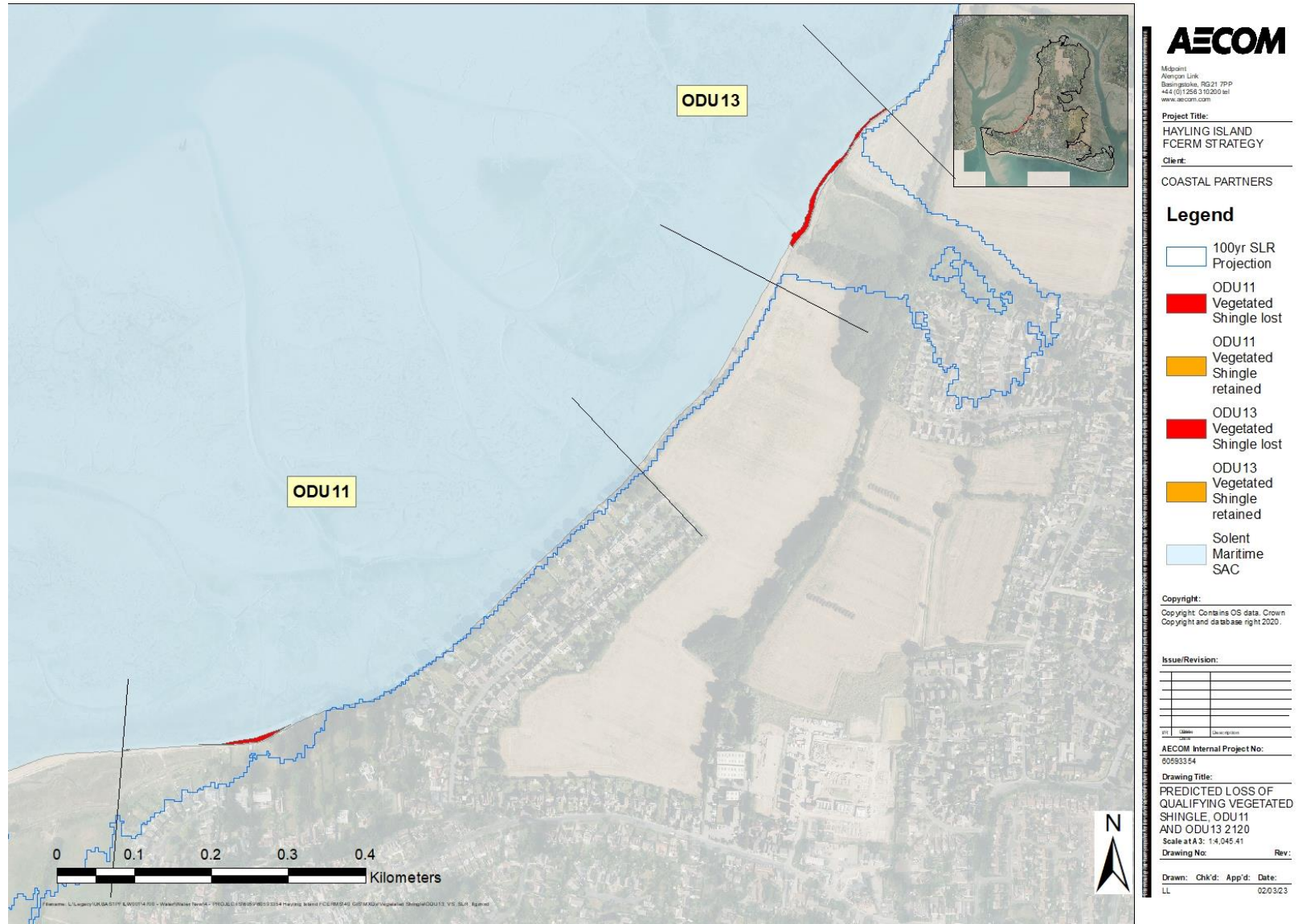


Figure 6: Predicted loss of vegetated shingle in ODU 11 and ODU 13 due to Hold the Line policy approaches in the HICMS.

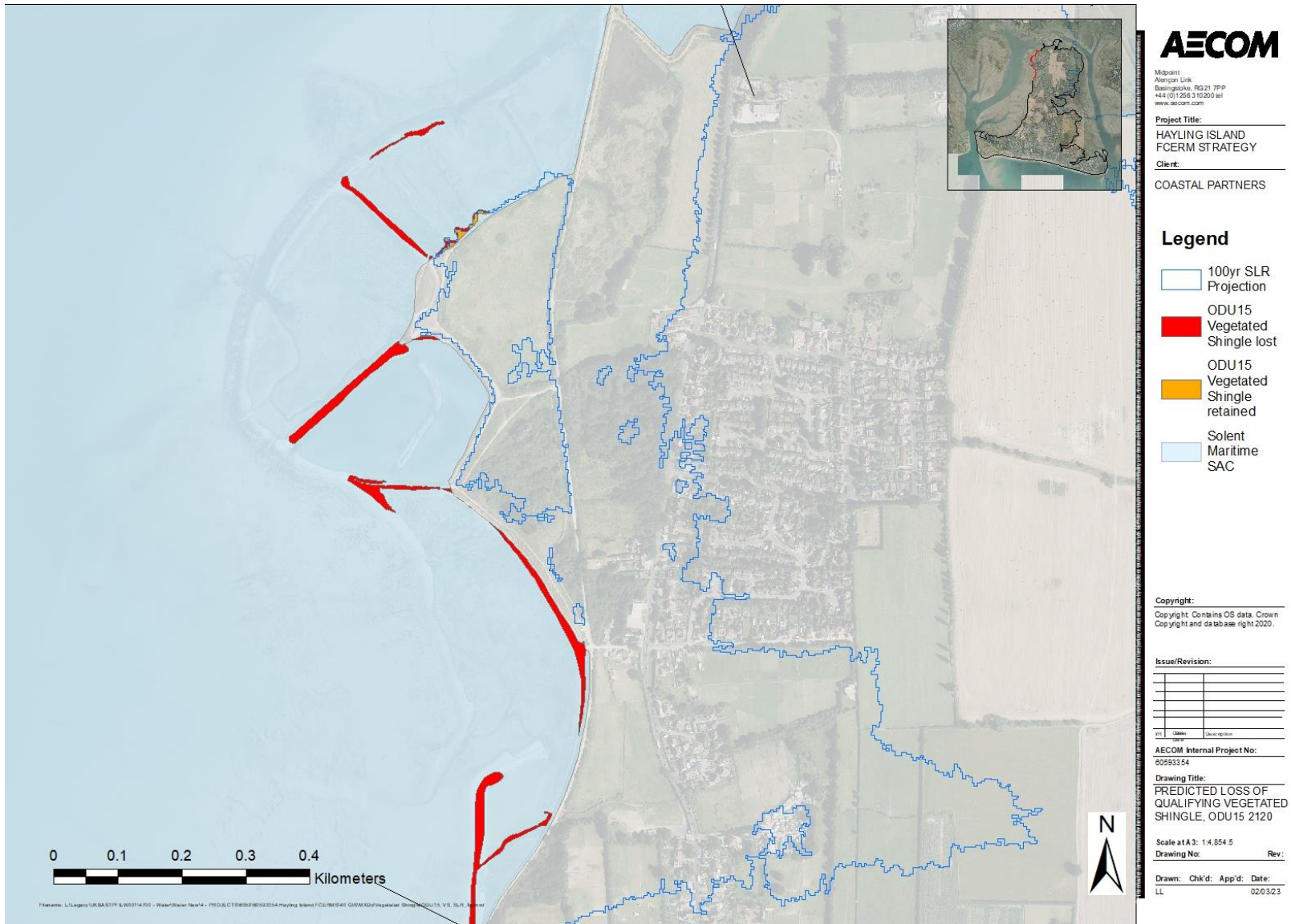


Figure 7: Predicted loss of vegetated shingle in ODU 15 due to a Hold the Line policy approach in the HICMS.



- 5.13 Although adverse effects of the HICMS on the integrity of the Solent Maritime SAC regarding vegetated shingle loss will therefore arise, which is primarily due to the Hold the Line policy approaches set by the NSSMP for the entire Hayling Island frontage. In fact, the only change in policy approach in the HICMS compared to the NSSMP (a change from Hold the Line to No Active Intervention in ODU 14) is positive for the Solent Maritime SAC because it reduces the extent of projected shingle habitat loss by approx. 0.59ha.
- 5.14 The loss of vegetated shingle was also considered in the overarching NSSMP HRA. This states that *'HTL policies are likely to have a significant detrimental effect on intertidal habitats and vegetated shingle backed by a seawall, causing loss through coastal squeeze.'* However, in contrast to intertidal habitats, the HRA undertook no quantitative assessment of projected losses. Instead, it was concluded that the loss of vegetated shingle would be offset by coastal accretion along other parts of the foreshore. For example, in relation to the Solent Maritime SAC, the HRA explains that *'there will be vegetated shingle lost through coastal squeeze processes at policy unit 5F01 where HTL is the policy for all three epochs and at 5C18 and 5C15 in the 1<sup>st</sup> and 2<sup>nd</sup> epoch. However, NAI policy at policy unit 5B03 will result in continued vegetated shingle stabilisation at Hook spit. In conclusion, the assessment considers that there **would not be an adverse effect** to site integrity.'* As a result of this conclusion, no strategic compensatory coastal vegetated shingle habitat creation is included within the HCRP for the North Solent, unlike for intertidal habitats.
- 5.15 Due to the passage of time and evolution of HRA case law, the more detailed analysis available, the updated sea level rise projections, and relatively large proportion of forecast vegetated shingle loss, it is considered that a conclusion of 'no adverse effects on integrity' can no longer be relied upon with regard to Hayling Island. Furthermore, because vegetated shingle loss was not assessed quantitatively at the NSSMP level, there is no established compensatory mechanisms embedded in the Solent and South Downs HCRP. **Overall, adverse effects of the HICMS on the integrity of the Solent Maritime SAC due to coastal squeeze and associated loss of vegetated shingle banks cannot be excluded at this plan level.**
- 5.16 **By definition, any more than a trivial habitat loss from a European site is considered to have an adverse effect on site integrity. As such, a conclusion of no adverse effects on integrity cannot be drawn regarding loss of intertidal habitats within the Solent Maritime SAC and the Chichester & Langstone Harbours SPA / Ramsar and vegetated shingle within the Solent Maritime SAC due to Hold the Line policies within the HICMS.**
- 5.17 It follows, that in order to receive consent for adoption, the HICMS must meet three derogation tests, namely No Reasonable Alternatives being available that would deliver the same objectives (without harming the European site), IROPI and delivery of adequate compensation. These tests are addressed in **Chapter 6**.

## Direct SAC Habitat and SPA / Ramsar Supporting Habitat Loss – Subtidal Habitat

- 5.18 Chapter 4 screened in the potential for structures in subtidal areas to result in the permanent loss of SAC habitats and / or SPA / Ramsar supporting habitats. Replacement rock groynes are proposed in ODU 8 and ODU 9, with the overall aim to maintain the existing groyne field. The length and spacing of rock groynes depend on the magnitude of cross-shore erosion and the length of beach requiring protection. However, these characteristics will be further explored towards the detailed design and planning application of individual schemes when the footprint of replacement groynes will be confirmed. Accompanying AAs will need to assess in detail any designated or supporting habitat loss associated with the delivery of replacement groynes. **Due to a lack of detail at the HICMS level, the appraisal of this impact pathway is deferred to individual schemes and planning applications.**
- 5.19 It is considered that the delivery of groynes in ODU 8 and ODU 9 is **unlikely** to lead to adverse effects on the integrity of the Solent Maritime SAC and Chichester and Langstone Harbours SPA / Ramsar for the following reasons (it is to be noted that these assumptions will need to be confirmed as schemes are progressed to the planning application stage):

- Since the focus is on groyne replacement and maintaining the overall dimension of the groyne field, it is unlikely that the HICMS will lead to any significant additional subtidal habitat loss beyond to that already lost under the existing groyne field; and
- Even if it did so, the ‘sandbanks slightly covered by seawater all the time’ SAC feature, the habitat most likely to be affected by replacement groynes along the south of Hayling Island, comprise an area of over 2,000ha. The cumulative footprint of any replacement groynes is likely to be less than 1ha in extent (possibly considerably less). In the context of the large remaining area of subtidal sandbanks, this loss would be considered trivial.

## Direct SPA / Ramsar Habitat Loss – Landward (Coastal Grazing Marsh and Freshwater) habitat

5.20 Managed Realignment and Do Nothing approaches have the potential to result in the loss of landward freshwater and coastal grazing marsh habitats that, due to their importance as wetland habitats (Ramsar) and for supporting birds (SPA / Ramsar), have been included in the designation. High-tide roosts and foraging areas for waders and waterfowl could potentially be lost where existing sea defences within the SPA / Ramsar boundary are moved landward, which is proposed for ODU 3 and ODU 5.

5.21 **Table 4** lists the extent of landward habitats within the SPA / Ramsar boundary that is projected to be lost due to Managed Realignment. SPA / Ramsar habitat loss is depicted graphically for ODU 3 (**Figure 8**) and ODU 5 (**Figure 9**). A total of 40.19ha of high-tide foraging and roosting SPA / Ramsar habitat is expected to be lost<sup>57</sup> across the three epochs covered by the HICMS. Habitat loss amounts to 39.91ha for coastal grazing marsh and 0.28ha for freshwater habitats. For all ODUs the majority of habitat loss is projected to occur in epoch 1 compared to epochs 2 and 3. Furthermore, landward SPA / Ramsar habitat loss is a more substantial concern for ODU 5 than ODU 3.

**Table 4: Projected loss of landward freshwater and coastal grazing marsh habitats<sup>58</sup> within the Chichester and Langstone Harbours SPA / Ramsar due to Managed Realignment and Do Nothing approaches proposed in the HICMS. Red shading highlights the ODUs for which habitat loss is of more substantial concern.**

Option Unit (ODU)	Development SWBGS Site Code	Epoch	Habitat Type	Cumulative Area Lost (ha)
ODU 3 – Northney Farm to Chichester Road	H59C	1	Coastal grazing marsh	0.94
			Freshwater habitat	0.02
		2	Coastal grazing marsh	1.03
			Freshwater habitat	0.02
		3	Coastal grazing marsh	1.08
			Freshwater habitat	0.02
H64	H64	1	Coastal grazing marsh	0.01
			Freshwater habitat	0.01
		2	Coastal grazing marsh	0.01
			Freshwater habitat	0.01
		3	Coastal grazing marsh	0.01
			Freshwater habitat	0.01
ODU 5 – Mill Rythe Junior School to Salterns Lane	H40C	1	Coastal grazing marsh	23.88
			Freshwater habitat	0.08
		2	Coastal grazing marsh	24.28

<sup>57</sup> For purposes of this HRA, habitat loss was considered to occur where the MHWN and HAT predicted water levels intersect with an area of SPA/Ramsar supporting habitat. All habitat loss reflects the final year of an epoch. While this loss would not be permanent (at least initially), supporting habitats would be unavailable for long stretches of time.

<sup>58</sup> Loss of coastal grazing marsh and freshwater habitat is provided cumulatively across epochs.

Option Unit (ODU)	Development	SWBGS Site Code	Epoch	Habitat Type	Cumulative Area Lost (ha)
				Freshwater habitat	0.08
			3	Coastal grazing marsh	24.68
				Freshwater habitat	0.08
	H40D		1	Coastal grazing marsh	14.09
				Freshwater habitat	0.16
			2	Coastal grazing marsh	14.11
				Freshwater habitat	0.17
			3	Coastal grazing marsh	14.14
				Freshwater habitat	0.17
All ODUs	All SPA / Ramsar Parcels		All Epochs	Total coastal grazing marsh	39.91
				Total freshwater habitat	0.28







- 5.22 **By definition, any more than a trivial habitat loss from a European site is considered to have an adverse effect on site integrity. As such, a conclusion of no adverse effects on integrity cannot be drawn regarding loss of SPA / Ramsar coastal grazing marsh and freshwater habitats that provide high-tide roosting and feeding areas for waders and waterfowl within the Chichester & Langstone Harbours SPA / Ramsar.**
- 5.23 It follows, that in order to receive consent for adoption, the HICMS must meet three derogation tests, namely No Reasonable Alternatives being available that would deliver the same objectives (without harming the European site), IROPI and delivery of adequate compensation. These tests are addressed in **Chapter 6**.

## Loss of Functionally Linked Habitat

- 5.24 The HRA screening report for the HICMS concluded that certain management approaches, while positive for coastal processes, could result in the loss of landward habitats, such as coastal grazing marsh, grassland, reedbeds and arable land, that lie outside the SPA / Ramsar but are used by qualifying birds (i.e. areas of functionally linked habitat). The SWBGS<sup>59</sup> established that there is a mismatch between the geographic areas included under the SPA / Ramsar designations and the actual habitat requirements of the waterfowl / wader species. The SWBGS notes that *'birds are mobile species, they are also dependent on sites outside of formal designations and rely on the availability of a network of feeding and roosting resources over the winter period.'* Overall, the Chichester and Langstone Harbours support 20% of the national population of dark-bellied brent geese and 9% of the international population, with the Solent supporting approximately 10-13% of the world population of dark-bellied brent geese.
- 5.25 As established by the SWBGS, birds overwintering in the Solent utilise a vast network of off-site supporting habitats, which has been subject to continuing pressure from development and agriculture. The importance of inland terrestrial habitats (e.g. farmland and amenity grassland) to the brent geese population in the Solent has increased since the 1950s, as natural food sources are no longer sufficient to meet the nutritional requirements of birds. The use of terrestrial habitat pockets is also higher in years with larger numbers of juveniles and harsher winters (due to eelgrass dieback). Certain species, notably black-tailed godwit and curlew, also use inland fields as a feeding resource, sometimes a significant distance inland, which in the case of curlew can include arable fields. Most waders feed primarily in the intertidal zone at low tide and move to roosting sites (e.g. saltmarsh, shingle banks, coastal grassland and manmade structures) at high tide. These roost sites, although typically within 100m from the Mean High Water (MHW) line, may lie outside the designated site boundary and certain inland fields also seem to have significance as extreme weather refuges for the variety of wader species.
- 5.26 The different iterations of the SWBGS, particularly the 2010 SWBGS, have established a range of criteria that are likely to shape the suitability of sites for brent geese and / or waders. This assessment included a statistical comparison of sites comprising various features and levels of site use. The following site parameters were found to significantly predict site usage by brent geese:
- Area (ha) – larger habitat parcels typically supported more geese over longer time periods;
  - Shape – uniformly shaped land parcels (i.e. square) were found to be frequented more often;
  - Disturbance impacts – habitats with buildings in the 50-500m were correlated to significantly lower site usage, most likely due to visual disturbance and impacts on flight paths;
  - Ground topography – low-lying and flat ground supported higher abundances of brent geese and waterfowl;

<sup>59</sup> Solent Waders and Brent Goose Steering Group. (2020). Solent Waders and Brent Goose Strategy. 43pp. Available at: <https://solentwbgs.files.wordpress.com/2021/03/solent-waders-brent-geese-strategy-2020.pdf> [Accessed on the 21/03/2022]



- Habitat – coastal grazing marsh, amenity grassland and agricultural habitats encompass the key supporting habitats; and
  - Isolation index – sites are more likely to support brent geese if they are surrounded by other established goose supporting sites.
- 5.27 While the off-site habitat requirements of waders are similar to those of brent geese, there are additional parameters that predict suitable wader sites, most of which particularly relate to disturbance. For example, the statistical model showed that waders are more likely to be present if there are no areas of buildings within a 50m, 50-500m and 500-2,500m zone of a land parcel. Equally, an absence of housing development within 15 or 30 minutes also renders a parcel more suitable for roosting waders. Furthermore, waders also appear to prefer roost sites that are more isolated from other roosts.
- 5.28 The primary objective of the SWBGS is to ensure the adequate availability of feeding and roosting resources across the Solent and the integrity of the network of supporting sites is maintained / restored. Wherever possible, the target is to conserve extant sites and enhance the quality / availability of supporting habitats. Therefore, strategic plans (such as the HICMS) and individual planning proposals must consider the available evidence and preserve established supporting habitats. Owing to the compact nature of Hayling Island (approx. 3,000ha), brent goose supporting habitats, wader roosts and development occur side-by-side. Inevitably, changes to coastal management, and critically where such management decisions allow the flooding of inland habitats, the risk for loss of functionally linked habitat is high. The following paragraphs discuss the ODUs of highest concern, specifically where the SWBGS has identified land parcels as Core Areas for qualifying waterfowl and waders.
- 5.29 SWBGS sites are classified as Core Areas if they satisfy several criteria, including a network value, and / or a maximum score of 7 in the parameters of GB Importance, SPA Importance and SPA Assemblage, and / or a maximum count of 1,000 qualifying birds. For example, a site has a proven network value if it has movement connection to many other supporting sites (hub) or links together two areas of the network (bottleneck). Rarely, certain sites may act as both hubs and bottlenecks. Their critical importance both in terms of geographical linkage and supported bird numbers, means that loss of Core Areas should be protected against. Two areas of Hayling Island have been identified as being at significant risk from the loss of functionally linked habitats due to the policies proposed in the HICMS:
- North-east of the Hayling Island, covered by ODU 1 and ODU 3, encompasses relatively large parcels of amenity grassland (e.g. Hayling Island North Common) and agricultural land (rectangular and square-shaped fields to the east of Northney and North Hayling), all of which are classified as Core Areas; and
  - West of Hayling Island, covered by ODU 12, ODU 14 and ODU 15, encompasses uniformly shaped agricultural fields adjoining the Hayling Island Billy Trail, five of which are identified as Core Areas in the SWBGS.
- 5.30 Several coastal management approaches maybe associated with the loss of functionally linked habitat, including Do Nothing and Managed Realignment through setback floodwalls / earth embankments. For example, doing nothing will allow existing defences to fail over time, resulting in the subsequent flooding of hinterland. 'Managed Realignment' also allows historic frontline defences to fail, be removed or breached, creating intertidal habitats between the old flood protection structures and new flood defences. The draft Strategy indicates that such approaches are encompassed in the Leading Options for several ODUs that are adjacent to functionally linked habitats (as indicated by SWBGS sites), including ODU 1B, ODU 3, ODU 5B, ODU 12, ODU 14 and ODU 15. **Table 5** identifies the ODUs for which setback defences / earth embankments are proposed, describes their locations and the context of the supporting sites identified in the SWBGS.

**Table 5: ODUs for which setback defences / embankments are proposed and where SWBGS functionally linked habitats outside the Chichester and Langstone Harbours SPA / Ramsar may be lost.**

<b>ODU</b>	<b>Description of location and proposed HICMS policy</b>	<b>Functionally linked high tide feeding and roosting habitats identified in the SWBGS</b>
ODU 1B	A setback embankment is proposed in epoch 1, which will create additional intertidal habitat in line with the Solent & South Downs HCRP.	The affected area includes a range of land parcels identified in the SWBGS, including two Primary Support Areas (H129 and H64), an area of Low Use (H63) and a Core Area (H65). Some limited risk of functionally linked habitat loss due to inundation of areas used by waterfowl and waders.
ODU 3	Along a small section within this ODU a setback embankment is proposed to allow for the creation of intertidal habitats in line with the HCRP.	There are various SWBGS sites along this ODU, primarily comprising agricultural land and grassland. The SWBGS identifies three Core Areas (H59A, H59D and H59E), one Secondary Support Area (H59B) and one Primary Support Area (H59F) here.
ODU 5B	New setback defences are proposed with the potential for additional intertidal habitat creation.	A range of SWBGS functionally linked habitats could be lost as a result of the inundation of presently terrestrial sites, including a Core Area (H40B) and one Secondary Support Area (H40A). Intermediate risk of some limited functionally linked habitat loss.
ODU 12	The leading management option in this ODU is to Do Nothing, as there is no risk from flooding / erosion to properties and infrastructure.	Directly adjoining this ODU is a Core Area (H34C), which is at risk of being lost in the face of rising sea levels and its undefended coastline. Notably, this site is also designated as a bird refuge in the emerging Havant Borough Local Plan.
ODU 14	The approach for this ODU is to Do Nothing, allow the existing defences to fail and natural coastal processes to occur in combination with the predicted sea level rise.	The SWBGS identifies this part of Hayling Island as providing important functionally linked habitats to SPA / Ramsar waders and waterfowl. There are numerous functionally linked parcels along the Hayling Billy Walking Trail, including four Core Areas (H48C, H48D, H48F and H48G), four Primary Support Areas (H48A, H48E, H52A and H53C) and two Secondary Support Areas (H48B and H52B).
ODU 15	The Leading Option in this ODU is to construct new setback defences in epoch 1 where appropriate (e.g. where no landfill sites are present), which will allow the transition of coastal habitats inland. However, due to the existence of landfill sites the existing frontline defences would be maintained to prevent their erosion, implying no functionally linked habitat will be lost.	SWBGS sites along this ODU include a section of one Primary Support Area (H53C), a Secondary Support Area (H53A) and three Low Use areas (H53B, H62A, H62B).

5.31 The implications of coastal management changes in these ODUs for functionally linked habitats must, therefore, be adequately appraised. The potential loss of SWBGS supporting sites due to the implementation of Leading Options proposed in the HICMS was calculated (**Table 6**). Overall, it is projected that six Core Areas, five Primary Support Areas, three Secondary Support Areas and one area of Low Use will be partially inundated due to failing or setback sea defences. As highlighted above, all supporting sites are important to varying degrees in sustaining dark-bellied brent geese and waders in terms of abundance and / or acting as hubs / bottlenecks.

**Table 6: Projected loss of SWBGS sites outside the SPA / Ramsar<sup>60</sup> due to Managed Realignment and Do Nothing approaches proposed in the HICMS, as a result of the combined effects of erosion and flooding processes. Red shading indicates the SWBGS sites for which functionally linked habitat loss is of more substantial concern.**

Option Development Unit (ODU) <sup>61</sup>	SWBGS Site Code	Type	Habitat	Epoch	Cumulative Area Lost (ha) <sup>62</sup>	% of Site
ODU 1B – Hayling Bridge to Northney Farm (see Figure 10)	H63	Low Use	Pasture, wet grassland, woodland	1	0.32	10.5
				2	0.37	12.3
				3	0.39	12.9
	H64	Primary Support Area	Wet grassland, shrub, woodland	1	0.01	0.2
				2	0.01	0.2
				3	0.01	0.2
	H129	Primary Support Area	Coastal embankment	1	0.24	7.7
				2	0.24	7.7
				3	0.24	7.7
ODU 5B – Mill Rythe Junior School to Salterns Lane (see Figure 11)	H40A	Secondary Support Area	Amenity grassland, treelines	1	0.04	0.1
				2	0.07	0.2
				3	0.1	0.3
	H40B	Core Area	Arable land and / or pasture	1	0.37	5.7
				2	0.52	8
				3	0.84	12.9
ODU 12 – North Shore Road to Newtown (see Figure 12)	H34C	Core Area	Arable land	1	0.11	0.9
				2	0.42	3.3
				3	1.02	8.2
ODU 14 – Newtown to Stoke (see Figure 13)	H48A	Primary Support Area	Pasture, wet grassland, freshwater pond	1	0.31	5.2
				2	0.55	9.2
				3	1.73	28.8
	H48B	Secondary Support Area	Pasture, treelines and brownfield development	1	1.25	22.6
				2	1.49	26.9
				3	2	36.1
	H48C	Core Area	Arable land	1	0	0
				2	0	0
				3	0.29	4.2
	H48D	Core Area	Arable land	1	0	0
				2	0	0
				3	0.35	4.6

<sup>60</sup> Loss of functionally linked land habitat is provided cumulatively across epochs.

<sup>61</sup> The loss of functionally linked habitats is depicted graphically in the referenced figures for each ODU.

<sup>62</sup> Any habitat loss below two decimal places (i.e. 90m<sup>2</sup> or lower) is considered to be 'de minimis', thus not requiring mitigation. With such minimal habitat loss, a large proportion of the supporting site would remain functional and continue to support SPA / Ramsar birds.

Option Development Unit (ODU) <sup>61</sup>	SWBGS Site Code	Type	Habitat	Epoch	Cumulative Area Lost (ha) <sup>62</sup>	% of Site
H48E		Primary Support Area	Arable land	1	0	0
				2	0.01	0.3
				3	0.28	8.6
H48F		Core Area	Arable land	1	0	0
				2	0.08	1
				3	0.6	7.8
H48G		Core Area	Arable land	1	0.12	1.2
				2	0.33	3.2
				3	0.76	7.3
H52A		Primary Support Area	Arable land, pasture and treelines	1	0	0
				2	0	0
				3	0.06	0.5
H52B		Secondary Support Area	Pasture	1	0	0
				2	0	0
				3	0.02	1.2





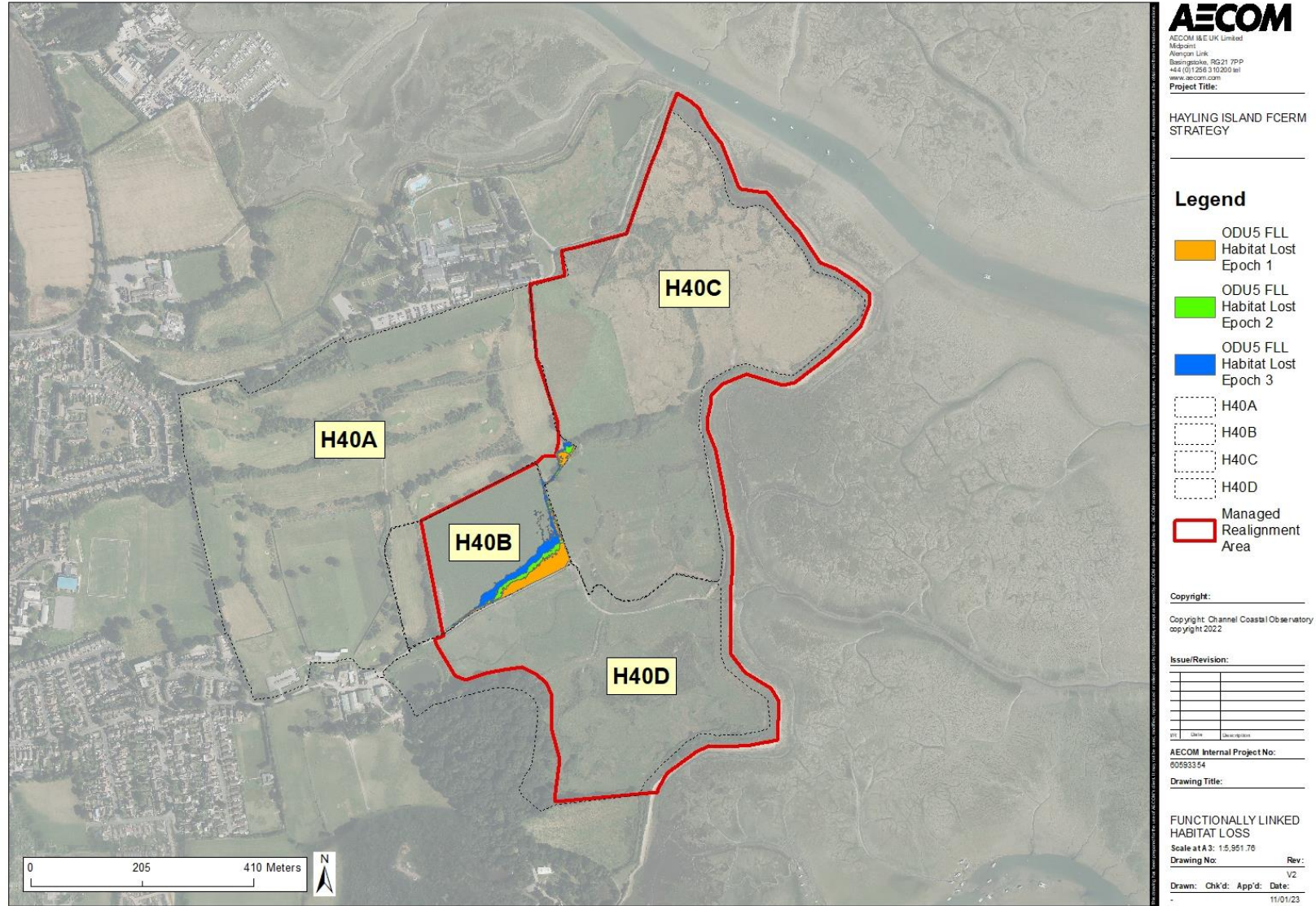


Figure 11: Functionally linked habitat loss due to Managed Realignment in ODU 5B.









5.32 The SWBGS Steering Group has published detailed guidance on mitigation and off-setting requirements relating to the loss of functionally linked habitats<sup>63</sup>. This guidance establishes that the long-term protection of the wider brent goose and wader network of sites is to be achieved by adequately off-setting the loss associated with development plans. Generally, the level of mitigation and off-setting requirements depends on the importance of a site to the wider ecological network. Core Areas are essential to the integrity of the Solent ecological network and have the strongest functional linkage to SPA / Ramsar sites in terms of frequency of use and supported abundances. The SWBGS considers that any unmitigated loss of Core Areas will result in adverse effects on the Solent's designated SPAs and Ramsar sites. Importantly, for many Core Areas there is a paucity of replacement opportunities due to a lack of alternative sites in close proximity to the relevant SPA / Ramsar.

5.33 Replacement assessments for SWBGS sites will be undertaken on a case-by-case basis and a set of stringent requirements must be fulfilled. For example, for Core Areas the following off-setting requirements should be met:

- Freehold or long-term lease of replacement sites for Core Areas must be passed on to an appropriate conservation body (e.g. Natural England) or the Local Planning Authority;
- Replacement sites must be of equal or greater size and quality, and should be located in close proximity to the areas that are being lost;
- Habitats in replacement sites should provide the same or an enhanced ecological function as those that are lost;
- Replacement sites should not be subject to regular recreational disturbance due to unmanaged public access, as this would significantly undermine its mitigation potential;
- A similar area of replacement habitat must be provided where it is of similar ecological quality to the habitat being lost / damaged, and a greater area should be supplied where the habitat created has poorer quality;
- Habitat should be 'effective' at the time it is required to off-set the adverse impact on the SPA / Ramsar;
- Replacement sites should be geographically sited as close as possible to the original site to maximise the chance of replicating its ecological structure and function;
- Ongoing monitoring of replacement sites and adequate future management is required to assure effective mitigation delivery; and
- Off-setting sites should be validated regarding their ecological function and resilient in the face of future pressures / challenges (e.g. climate change).

5.34 Mitigation approaches for Primary Support Areas (PSAs), Secondary Support Areas (SSAs) and areas of Low Use, owing to the fact that these are used less frequently by SPA / Ramsar waders and brent geese, are somewhat more flexible. While damage to or loss of SSAs and Low Use areas should be avoided and / or minimised, it is expected that suitable replacement habitat will be provided on-site in most cases. Due to their comparatively lower importance to the wider ecological network, it may also be acceptable that replacement habitats are delivered at greater distances to the affected SWBGS sites. If mitigation is not like-for-like (i.e. a smaller area or lower habitat quality is delivered), additional funding towards the management and / or enhancement of the wider ecological network of sites is indicated, such as through the Biodiversity Compensation Framework. Indicative guidance from the SWBGS Steering Group suggests financial mitigation contributions of £85,464 per ha of SSA and £35,610 per ha of Low Use site. Where SSAs or areas of Low Use will be lost completely and no replacement habitat is to be provided, a final mitigation package will be determined on a case-by-case basis with additional requirements (e.g. use of Environment Bank mitigation).

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<sup>63</sup> Solent Waders and Brent Goose Steering Group. (October 2018). Solent Waders and Brent Goose Strategy – Guidance on Mitigation and Off-setting Requirements. 15pp. Available at: <https://solentwbgsg.files.wordpress.com/2021/03/swbgs-mitigation-guidance-oct-2018.pdf> [Accessed on the 21/03/2022]

## Implications of Functionally Linked Habitat Loss

5.35 To evaluate whether mitigation will be needed, the habitat loss within each parcel was assessed individually by considering the presence of habitat type and historic birds records. Another important factor is the cumulative percentage of a site lost. For example, where an exceedingly small section of a parcel is lost (i.e. < 1%), this can be regarded as trivial and inconsequential. Even where a slightly larger portion of a site (i.e. < 10%) is lost to flooding and / or erosion, the remainder of the parcel will remain functional and retain its supporting role for SPA / Ramsar birds. The implications of the projected habitat loss and associated mitigation requirements, where applicable, are discussed in more detail in **Table 7**.

**Table 7: Implications of functionally linked habitat loss and mitigation requirements in ODUs where Managed Realignment or Do Nothing approaches will be used. Shaded rows identify the supporting habitat parcels for which mitigation is needed to avoid adverse effects on site integrity.**

ODU	SWBGS Parcel	Total Area Loss (ha)	Cumulative Habitat Loss (% of total area)	Discussion of Habitat Loss	Conclusion
ODU 1B	H63 (Low Use)	0.39	12.9	Site is predominantly scrub, so not currently suitable for SPA / Ramsar birds.  Low Use parcel with no historic bird records, although three bird records (lapwing, redshank and brent goose) in vicinity from 2015/16.  Inundation would turn the affected area to saltmarsh which could improve the site for SPA/Ramsar birds.	No need for mitigation and no adverse effects on site integrity
	H64 (Primary Support Area)	0.01	0.2	Site is almost entirely scrub, so not currently suitable for SPA / Ramsar birds.  Numerous species (e.g. brent goose, greenshank, grey plover, oystercatchers, redshank) with historic records in the vicinity.  Trivial amount of habitat loss (0.2%) on the right edge of the parcel.	No need for mitigation and no adverse effects on site integrity
	H129 (Primary Support Area)	0.24	7.7	Site is already partially intertidal (former saline lagoon with Spartina) due to a gap in the sea wall – no material change from current habitat conditions.	No need for mitigation and no adverse effects on site integrity
ODU 5B	H40A (Secondary Support Area)	0.1	0.3	Site includes part of a golf course with amenity grassland, however the amount of habitat loss is considered inconsequential	No need for mitigation and no adverse effects on site integrity
	H40B (Core Area)	0.84	12.9	Site encompasses a field that is used by foraging brent geese and roosting waders.  Habitat loss will need to be addressed through habitat improvements and mitigation provision within ODU 5B, as part of the Tournerbury Farm habitat creation scheme.	Mitigation is needed to avoid adverse effects on the integrity of the SPA / Ramsar
ODU 12	H34C (Core Area)	1.02	8.2	Site supports good numbers of foraging brent goose and is designated as a bird refuge in the emerging Havant Borough	No need for mitigation and no adverse effects on site integrity

				Local Plan, meaning that its overall functionality should be maintained.	
				Notwithstanding this, the area of loss is a small (8.2%) strip on the western edge of the parcel. The site will retain bird functionality, even if the coastal strip transitions to saltmarsh / mudflats.	
ODU 14	H48A (Primary Support Area)	1.73	28.8	Site supports good numbers of SPA / Ramsar birds.  It is considered that the quality and suitability to SPA / Ramsar birds of the parcel may be improved through conversion of the western area (coastal margin) to saltmarsh / mudflats.	No need for mitigation and no adverse effects on site integrity
	H48B (Secondary Support Area)	2	36.1	Site supports good numbers of SPA / Ramsar birds.  However, a relatively large portion of this parcel is already non-functional (brownfield development). Additionally, as is relevant to parcel H48A, a partial conversion of this site to saltmarsh / mudflats is likely to benefit some SPA / Ramsar species.	No need for mitigation and no adverse effects on site integrity
	H48C to H48G (predominantly Core Areas)	0.02 – 0.76	4.2 – 8.6	These agricultural fields are treated here as a functional unit, given their similar nature and importance to SPA / Ramsar birds. Notably, all parcels are safeguarded as bird refuges in the emerging Havant Borough Local Plan, implying their overall functionality should be maintained.  Losses in all parcels are relatively small and encompass thin strips of fields on the western coastal margin of sites. These losses / transition to intertidal habitat are considered inconsequential, and the remaining areas of parcels will continue to fulfil their supporting role.	No need for mitigation and no adverse effects on site integrity
	H52A (Primary Support Area)	0.06	0.5	The south-west corner of the site will be affected from a very small amount of flooding across West Lane. However, this is considered to be inconsequential to the functionality of the parcel.	No need for mitigation and no adverse effects on site integrity
	H52B (Secondary Support Area)	0.02	1.2	The southern tip of the site will be affected from a very small amount of flooding across West Lane. However, this is considered to be inconsequential to the functionality of the parcel.	No need for mitigation and no adverse effects on site integrity

5.36 The HICMS is a strategic management plan that proposes leading management options across a range of ODUs. This HRA summarises mitigation requirements for all three epochs, although habitat losses will need to be recalculated for epochs 2 and 3 using the latest LiDAR data and sea level rise projections (see previous section). The Leading Options for each ODU, including the footprint of individual schemes and their precise implications for functionally linked habitat loss, will be developed further as they progress towards the individual scheme level design and



planning application stage. While this AA identifies the type of mitigation that will be needed in ODU 5B, detailed mitigation plans will need to be developed for the design and planning application stage for the Tournerbury Farm habitat creation scheme where an adverse effect on functionally linked habitats has been identified. These would form part of the scheme-level design requirements and HRAs.

- 5.37 Overall, provided that the relevant statutory organisations are consulted at the earliest opportunity and involved in the scheme-level mitigation process, it is considered that adequate mitigation is achievable in principle within the Tournerbury Farm habitat creation site. On the basis that mitigation for functionally linked habitat loss can be delivered within the Tournerbury Farm habitat creation scheme, it is concluded that the HICMS will not result in adverse effects on the integrity of the Chichester and Langstone Harbours SPA / Ramsar regarding functionally linked habitat loss. However, the final resolution of this impact pathway is deferred to the scheme / planning application level, where satisfactory mitigation will need to be presented to obtain planning consent. Notwithstanding this, further work will be undertaken at the strategic level to identify suitable functionally linked replacement habitats, where a need is identified through collaborative appraisal.

## Changes to coastal hydrogeomorphic processes (sediment transport and accretion / erosion patterns)

- 5.38 Cross-shore structures such as groynes have the potential to significantly affect coastal hydrology, sediment transport and sediment accretion / erosion patterns. Groynes are built perpendicular to the shoreline with the aim to prevent coastal erosion, such as along beach profiles. At the same time, groynes prevent longshore drift which reduces the downstream movement of sediment and, depending on prevailing coastal hydrology, may result in downdrift erosion. Groynes are structures that have significant impacts on coastal profiles and should therefore only be considered as part of global adaptive management policies.
- 5.39 Groynes are likely to be most needed along the southern coastline of Hayling Island facing the English Channel, where wave action and the risk for coastal erosion is highest. Indeed, cross-shore structures are only proposed under the Leading Options for ODU 8 (Eastoke) and ODU 9 (Eastoke Corner to Inn on the Beach), with the aim to minimise sediment loss and nourish existing beach profiles. However, in all instances these suggested structures are replacements for existing groynes or other structures that already prevent longshore sediment transport. For example, the Leading Option for ODU 8 states that *'All existing groynes would then be replaced by new rock groynes. Beach nourishment and recycling would continue to keep the beach in place...'*
- 5.40 In ODU 9, the Inn on the Beach currently acts as a terminal groyne, allowing sediment to accumulate and holding the beach in place on the east side. The Leading Option proposes to maintain the existing defences at the inn or replacing them with functionally similar structures that prevent sediment dynamics from changing. Furthermore, all groynes in the east of the area are to be replaced with new rock groynes. Importantly, the existing overall size of the groyne field is to be maintained and is not projected to increase.
- 5.41 Considering that HICMS does not propose net additional cross-shore structures along Hayling Island's shoreline, it is concluded that impacts on hydrogeomorphic processes are very unlikely to occur. Care will need to be undertaken to ensure that the construction materials, footprint and hydrodynamic properties of replacement groynes will reflect those of the existing structures. Any replacement structures that are likely to alter Hayling Island's coastal profile will need to be supported by a bespoke HRA at the scheme level / planning application stage.
- 5.42 Provided the above is delivered, it is concluded that the HICMS will not result in adverse effects on the Chichester and Langstone Harbours SPA / Ramsar and the Solent Maritime SAC regarding changes to coastal processes.



## Recreational Disturbance to SPA / Ramsar and SAC features

- 5.43 The HRA Screening Report highlighted that coastal management options which result in the potential alteration and / or re-routing of public footpaths may introduce recreational disturbance to previously undisturbed areas. However, the screening was undertaken when Leading Options had not been identified and it was not certain whether the HICMS would involve impacts on recreational routes.
- 5.44 A re-routing of a Public Right of Way (PRoW) is only proposed under ODU 14 (Newtown to Stoke), which proposes a 'Do Nothing' approach. Allowing the existing defences to fail (likely within the next 10 years), places the Hayling Island Billy Trail (HIBT) at risk from coastal erosion and flooding. The Leading Option proposes to relocate the walking trail further inland to minimise the likelihood of flooding. However, the re-routing of the HIBT is unlikely to result in additional disturbance to qualifying SPA / Ramsar waterfowl and waders in functionally linked habitats. There are several SWBGS sites to the east of the current walking route (e.g. three Core Areas and three Primary Support Areas) and existing levels of recreational use have not impacted on the suitability of these offsite habitats for SPA / Ramsar birds. This is partly due to the HIBT being well screened by high hedge on either side. It is recommended that any re-routing proposals should consider similar screening methods to minimise disturbance. Provided that adequate screening is implemented, the re-routing of the HIBT will not result in increased levels of use and disturbance potential to SPA / Ramsar birds.
- 5.45 The emerging Havant Borough Local Plan has identified several potential overwintering bird refuges across Hayling Island (some of which overlap with supporting habitats identified in the SWBGS), which could also be impacted by increased disturbance levels. The current trajectory of the HIBT already adjoins some of the refuges identified on the west coast of the island and moving the trail further inland would potentially lead to a reduction in recreational disturbance in these land parcels. One bird refuge in the northern section of the island, an agricultural field (H60D), lies approx. 623m from the existing location of the HIBT and is therefore unlikely to be impacted, even if the trail was moved slightly further inland. The field also adjoins housing and roads, implying that it is already subject to some level of disturbance.
- 5.46 Overall, it is concluded that the HICMS will not result in adverse effects on the supporting habitats of the Chichester and Langstone Harbours SPA / Ramsar and sensitive qualifying habitats in the Solent Maritime SAC regarding recreational disturbance. The proposed change to the route of the HIBT is not associated with an increased potential for bird disturbance. Furthermore, moving this long-distance route further inland reduces the potential for visitors to cause damage to sensitive SAC habitats, including annual vegetation of drift lines and perennial vegetation of stony banks. No recommendations for mitigation are required.

## Erosion, flooding and disturbance of coastal landfill sites

- 5.47 The HRA Screening Report established that 'Do Nothing' and Managed Realignment managements approaches could lead to the exposure and leaching of pollutants from contaminated land through erosion and / or flooding. Contaminants that are present within historic landfill sites can include substances such as asbestos, heavy metals, hydrocarbons and synthetic compounds (e.g. polychlorinated biphenyls, antifoulants, pesticides and pharmaceuticals). The washout of these substances onto intertidal habitats and the marine environment has the potential to negatively impact the health of SAC habitats and SPA / Ramsar species. Eight historic landfill sites on Hayling Island have been identified to be at risk of erosion and flooding over the next 100 years. Most of these sites lie very close to intertidal areas rather than towards the centre of the island, placing them at heightened risk of flooding. The following paragraphs discuss historic landfill sites, their corresponding ODUs and the coastal management approaches proposed in these areas.
- 5.48 There is a historic landfill site to the north-east of Northney, situated in ODU 1C, that directly abuts SAC and SPA / Ramsar habitats. However, the Leading Option for the locale of the landfill

site proposes the sustenance of the existing frontline defences. The OAR specifies that *'in the east side, this option protects the historic landfill at Northney Farm from flooding and coastal erosion. For both environmental and social reasons, it is important to prevent the historic landfill from eroding in the future and reduce the risk of contaminated land exposure.'*

- 5.49 Two historic landfill sites lie in ODU 4 (Yachthaven, Copse Lane, Land at Fleet Farm Caravan Park and Mill Rythe Lane industrial land) directly adjoining intertidal habitats. The overall approach for ODU 4 is 'Resilience', which mainly encompasses Property Flood Resilience measures rather than maintaining frontline defences across the entire stretch of the ODU. However, the Leading Option also explicitly includes the maintenance of frontline flood defences to prevent erosion and flooding impacts in the landfill sites.
- 5.50 There is one historic landfill site (Mengham Lane) within ODU5C. The OAR highlights that the management approach for ODU 5C is to sustain the existing frontline defences, such that this landfill site will be protected from erosion and flooding.
- 5.51 There are two historic landfill sites (Former Oyster Beds, Selsmore and Land at Fishery Creek Campsite, Selsmore) in ODU 7. The Leading Option for this ODU is to Sustain the existing frontline defences to a minimum of 0.5% AEP (a 1 in 200 year event). New defences will be constructed in epoch 1 (2021-2041) and raised over time to keep pace with sea level rise. The OAR states that *'the option would also prevent erosion of the historic landfill at Selsmore and Fishery Creek.'*
- 5.52 Overall, given that the HICMS sustains and improves the seaward defences along all eight identified historic landfill sites, it is concluded that the strategy will not result in adverse effects on the Solent Maritime SAC and Chichester and Langstone Harbours SPA / Ramsar regarding erosion and flooding of coastal landfill sites.

## Integrity Test

- 5.53 The following impact pathways have been concluded not to result in adverse effects alone and, therefore, must be considered in-combination with other plans and projects (see following section):
- Direct SAC habitat and SPA / Ramsar supporting habitat loss – Subtidal habitat;
  - Loss of functionally linked habitat (SWBGS sites);
  - Changes to coastal hydrogeomorphic processes (sediment transport and accretion / erosion patterns);
  - Recreational disturbance to SPA / Ramsar and SAC features; and
  - Erosion, flooding and disturbance of coastal landfill sites.
- 5.54 Adverse effects alone on site integrity could not be excluded for the following three impact pathways, which need to proceed to the derogation stage:
- Direct SAC and SPA / Ramsar habitat loss and gains – Intertidal (littoral) habitat;
  - Direct SAC habitat loss – Vegetated shingle (supralittoral) habitat; and
  - Direct SPA / Ramsar habitat loss – Landward (coastal grazing marsh and freshwater) habitat.

## In-Combination Assessment

- 5.55 Compliance with the Habitats and Species Regulations 2017 (as amended) requires development plans to assess whether they will have an adverse effect on a European site, either 'alone' or in-combination with other plans and projects. Other plans and projects adopted and consented on Hayling Island, and the wider Solent region, may contribute their own portions to relevant impact pathways, acting cumulatively with the pressures exerted by the HICMS. The assessment of in-combination effects is most relevant regarding effects on European sites that

are regarded as inconsequential 'alone'. The following plans and projects have the potential to act in-combination with and exacerbate some of the impacts associated with the HICMS:

- Havant Borough Core Strategy (6,300 new dwellings and 16.2ha of employment floorspace to be delivered up to 2026)<sup>64</sup>;
- Emerging new Havant Borough Local Plan and associated mitigation measures (e.g. safeguarding of bird refuges);
- Fareham Borough Local Plan (3,729 new dwellings and 4.1ha of employment floorspace to be delivered in the period to 2026)<sup>65</sup>;
- Gosport Borough Local Plan (3,060 new dwellings and 9.45ha of employment floorspace to be delivered in the period to 2029)<sup>66</sup>;
- The Portsmouth Plan (8,387 new dwellings and 24.3ha of employment floorspace to be delivered by 2027)<sup>67</sup>;
- Chichester Local Plan (7,388 new dwellings and a minimum of 25ha of employment land to be delivered by 2029)<sup>68</sup>;
- North Solent Shoreline Management Plan<sup>69</sup> (aims to balance the management of coastal flooding and erosion risk with the requirements regarding climate change and natural process and sets out coastal management approaches across large stretches of frontage – this SMP has been adopted and subjected to HRA as part of the statutory consenting process);
- Isle of Wight Shoreline Management Plan<sup>70</sup> (provides approaches for the management of coastal assets in relation to coastal flood and erosion risk with the aim to provide the greatest benefit for the environment, society and economy – this SMP has been adopted and subjected to HRA as part of the statutory consenting process);
- River Hamble to Portchester Coastal Strategy<sup>71</sup> (identifies preferred strategic management options along Fareham's and Gosport's coastline, based on objectives identified in the North Solent SMP – this strategy has been adopted and subjected to HRA as part of the statutory consenting process);
- Portchester Castle to Emsworth Strategy<sup>72</sup> (identifies preferred strategic management option for the 27km frontage between Portchester Castle and Emsworth, Hampshire, based on objectives identified in the NSSMP – this strategy has been adopted and subjected to HRA as part of the statutory consenting process);
- Portsea Island Coastal Strategy Study<sup>73</sup> (identifies the coastal management approach for Portsea Island, based on objectives identified in the North Solent SMP, concluding that a 'Hold the Line' approach is essential to protect livelihoods and businesses on the island – this strategy has been adopted and subjected to HRA as part of the statutory consenting process);

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<sup>64</sup> Adopted March 2011. Available at:

<https://cdn.havant.gov.uk/public/documents/ADOPTED%20CORE%20STRATEGY%20.pdf> [Accessed on the 28/06/2022]

<sup>65</sup> Adopted August 2011. Available at: <http://planningpdf.fareham.gov.uk/pdf/planning/CoreStrategyAdopted.pdf> [Accessed on the 28/06/2022]

<sup>66</sup> Adopted October 2015. Available at: [https://www.gosport.gov.uk/media/1210/Local-Plan-2011-2019-Written-Statement/pdf/Gosport\\_Borough\\_Local\\_Plan\\_2011-2029\\_-\\_adopted\\_version\\_b.pdf?m=636971633273370000](https://www.gosport.gov.uk/media/1210/Local-Plan-2011-2019-Written-Statement/pdf/Gosport_Borough_Local_Plan_2011-2029_-_adopted_version_b.pdf?m=636971633273370000) [Accessed on the 28/06/2022]

<sup>67</sup> Adopted January 2012. Available at: <https://www.portsmouth.gov.uk/wp-content/uploads/2020/05/The-Portsmouth-Plan.pdf> [Accessed on the 28/06/2022]

<sup>68</sup> Adopted July 2015. Available at: [https://www.chichester.gov.uk/media/24759/Chichester-Local-Plan---Key-Policies-2014---2029/pdf/printed\\_version.pdf](https://www.chichester.gov.uk/media/24759/Chichester-Local-Plan---Key-Policies-2014---2029/pdf/printed_version.pdf) [Accessed on the 28/06/2022]

<sup>69</sup> Available at: <https://www.northsolentsmp.co.uk/> [Accessed on the 29/06/2022]

<sup>70</sup> Available at: <https://www.iow.gov.uk/azservices/documents/2782-D7-Isle-of-Wight-Shoreline-Management-Plan-2.pdf> [Accessed on the 29/06/2022]

<sup>71</sup> Available online at: [http://planningpdf.fareham.gov.uk/PDF/planning/local\\_plan/DraftLocalPlanEvidenceBase/EV45-HambletoPortchesterCoastalStrategy.pdf](http://planningpdf.fareham.gov.uk/PDF/planning/local_plan/DraftLocalPlanEvidenceBase/EV45-HambletoPortchesterCoastalStrategy.pdf) [Accessed on the 29/06/2022]

<sup>72</sup> Available at: <https://coastalpartners.org.uk/project/portchester-castle-to-emsworth-strategy> [Accessed on the 26/10/2022]

<sup>73</sup> Available at: <https://coastalpartners.org.uk/project/portsea-island-coastal-strategy> [Accessed on the 29/06/2022]

- Pagham to East Head Coastal Defence Strategy<sup>74</sup> (provides for the coastal management approaches along a wide frontage in line with the overarching North Solent SMP and recommended several approaches including 'Hold the Line' and 'Managed Realignment' (e.g. at Medmerry – this strategy has been adopted and subjected to HRA as part of the statutory consenting process);
- South Marine Plan<sup>75</sup> (covers an area of approx. 20,000km<sup>2</sup> of inshore and offshore waters across 1,000km of coastline between Folkestone and the River Dart, setting out specific planning policies to regulate activities in the marine environment – a HRA Appropriate Assessment of the plan determined it would not result in adverse effects on European sites alone and in-combination);
- South Hayling Island Beach Management Plan (2017-2022)<sup>76</sup> (delivers beach management to ensure adequate flood protection in line with the North Solent SMP using beach recycling and beach recharge methods – this project is already being implemented and would have undergone prior HRA);
- Farlington Marshes Flood and Coastal Erosion Risk Management scheme (seeks to strengthen existing sea defences that are in poor condition at Farlington Marshes and deliver intertidal habitat creation via Regulated Tidal Exchange to ensure that the site continues to support the qualifying birds of the Chichester and Langstone Harbours SPA / Ramsar);
- North Portsea Island Coastal Defence Scheme (implements the Hold the Line approach identified in the NSSMP by providing improved defences as well as delivering environmental and social realm benefits and enhancements); and
- Southsea Coastal Scheme<sup>77</sup> (largest local authority-led coastal defence project in the UK to reduce coastal flood risk, stretching for 4.5km from Old Portsmouth to Eastney – Work on this project started in September 2020, such that it would have undergone prior HRA).

5.56 Regarding the following impact pathways discussed in the AA there is no potential for in-combination effects:

- Direct subtidal SAC and SPA / Ramsar habitat loss – due to there being no significant net change in the footprint of cross-shore structures in the subtidal environment;
- Changes to coastal hydrogeomorphic processes (sediment transport and accretion / erosion patterns) – due to there being no net increase in the number of cross-shore structures along the Hayling Island frontage and, therefore, no change that would be relevant to coastal evolution;
- Recreational disturbance to SPA / Ramsar and SAC features – due to the potential inland relocation of the HIBT not having potential disturbance implications for SPA / Ramsar birds and reducing trampling damage to the SAC habitats 'annual vegetation of drift lines' and 'perennial vegetation of stony banks';
- Erosion, flooding and disturbance of coastal landfill sites – due to confirmed 'Hold the Line' approaches seaward of all eight historic landfill sites on Hayling Island, thereby removing the potential for this impact pathway.

5.57 Given the limited impact potential regarding loss of functionally linked habitat (SWBGS sites), adverse effects of the HICMS on the integrity of the Chichester and Langstone Harbours SPA / Ramsar alone were excluded. However, under the Conservation of Habitats and Species Regulations 2017 (as amended), the potential for adverse effects in-combination must also be

<sup>74</sup> Available at: [https://www.chichester.gov.uk/media/5225/Pagham-to-East-Head-draft-coastal-defence-strategy/pdf/PEHCDS\\_draft\\_summaryFINAL\\_1.pdf](https://www.chichester.gov.uk/media/5225/Pagham-to-East-Head-draft-coastal-defence-strategy/pdf/PEHCDS_draft_summaryFINAL_1.pdf) [Accessed on the 29/06/2022]

<sup>75</sup> Available at: <https://www.gov.uk/government/collections/south-marine-plans> [Accessed on the 29/06/2022]

adequately assessed. Functionally linked habitat loss in the wider Solent area has an important in-combination element in that all SWBGS supporting sites represent a functional unit. Furthermore, while the loss of supporting sites arising from one plan or project may not lead to adverse effects on site integrity at the population-level, the cumulative loss of such habitats across the Solent landscape poses a greater threat to the long-term health of bird populations. This is exacerbated by the high density of housing and industrial development along the Solent coastline, making alternative high-tide roosts and brent goose foraging areas a scarce resource. All Local Plans and Core Strategies have the potential to result in the loss of functionally linked habitats where they allocate greenfield sites for development. Coastal Strategies and Shoreline Management Plans, like the HICMS, may result in the flooding of supporting sites through Managed Realignment and No Active Intervention approaches.

- 5.58 However, as undertaken in this HRA with regard to the HICMS, all plans and projects are required to assess functionally linked habitat loss in accompanying HRAs. Adequate mitigation will need to be provided by all proposals, ensuring that in-combination adverse effects will not arise. In their role as the statutory consultee on environmental matters, Natural England will need to be consulted to ensure that mitigation interventions provide satisfactory alternative foraging and roosting sites where relevant. The SWBGS, established in 2010, provides guidance on the importance of all supporting habitats in the Solent. All plans and strategies should consider the SWBGS, including the strict mitigation requirements associated with the loss of Core Areas (CAs) and, to a lesser extent, Primary Support Areas (PSAs). The mitigation guidance suggests that any unmitigated loss of CAs and PSAs will result in adverse effects on site integrity. All plans and projects identified above will need to adequately mitigate the loss of critical supporting habitats to being granted consent for planning or adoption. Given that all development proposals will be required to mitigate their own anticipated impacts, it is concluded that there will be no adverse effects of the HICMS on the Solent's European sites regarding the loss of functionally linked habitats in-combination with other plans and projects.



## 6. Derogation - No Alternatives, IROPI and Compensation

### Objectives of the HICMS

6.1 Before assessing potentially less damaging alternative solutions, IROPI and compensation requirements regarding any of the impact pathways taken forward to the derogation stage, the objectives of the HICMS need to be considered. Initially it is important to ascertain the role that a coastal management strategy fulfils in the planning hierarchy for coastal management. The HICMS occupies the middle tier in the hierarchy, which identifies the coastal management approaches required to implement the policies in the overarching NSSMP, or review / adapt these where appropriate. In turn the HICMS determines the leading strategic option(s) for each section of the Hayling Island coastline, identifying the appropriate scheme or risk mitigation option for implementing the strategic option, which will then be explored in more detail at a scheme-level, where a preferred solution is selected, designed and submitted for planning approval. The overall aim of the HICMS is to produce a sustainable cohesive strategy for managing flood and coastal erosion risk for the island over the next 100 years. A range of objectives have been set to achieve this, including:

- Developing strategic coastal management options for Hayling Island for the next 100 years;
- Outlining a programme of investment to reduce the risk of coastal flooding and erosion to people living on the island;
- Identifying potential funding sources and partners to deliver that investment programme and be open and honest about where funding is likely to be a challenge;
- Incorporating adaptation strategies in locations where improvements to coastal defences are not feasible;
- Working towards a holistic and flexible solution for both people and nature;
- Responding to future changes (e.g. predicted sea level rise and climate change) while supporting sustainable development on the island; and
- Adopting a partnership approach between Havant Borough Council, statutory stakeholders (e.g. Natural England and the Environment Agency), landowners, businesses and local communities.

6.2 As highlighted in the OAR, the residual life of many of the existing flood defences on Hayling Island is between 10 and 20 years. Furthermore, many of the defences need to be upgraded to keep pace with the projected sea level rise. Failure to do so would imply a significant risk of failure and breach of the existing defences, placing essential infrastructure (e.g. homes and businesses) and sensitive receptors (coastal landfill sites) at risk from erosion and flooding.

### Direct SAC and SPA / Ramsar Habitat Loss and Gain – Intertidal (Littoral) Habitat

6.3 Adverse effects of the HICMS on intertidal habitat features of the Solent Maritime SAC and intertidal supporting habitats of the Chichester and Langstone Harbours SPA / Ramsar due to intertidal habitat loss from coastal squeeze could not be excluded in the AA. As such, this impact pathway must be carried forward to the derogation (No Alternatives, IROPI and compensation) stage.

6.4 The AA concluded that the HICMS will have an adverse effect alone on the integrity of the Solent Maritime SAC and Chichester and Langstone Harbours SPA / Ramsar regarding the permanent

loss of intertidal habitats within these European sites. As set out in the AA, this is due to Hold the Line policies in several ODUs (i.e. ODU 1A & 1C, ODU 2, ODU4, ODU 5A & 5C, ODU6 to ODU9, ODU10N, ODU11, ODU13, ODU 15 and ODU16), which will result in the loss of intertidal habitats squeezed between hard defences and rising sea levels.

- 6.5 As discussed in the AA, the strategic policy of Hold the Line for Hayling Island was set in the overarching NSSMP, which was adopted in 2010. The NSSMP underwent a thorough option selection process (which included the Do Nothing approach) to identify the policy approach that was most environmentally, technically and economically feasible. The associated NSSMP HRA concluded that the implementation of Hold the Line would lead to adverse effects on Solent's European sites regarding intertidal habitat loss. Importantly, the HRA also demonstrated that there were no alternative solutions delivering the same objective (i.e. protecting homes, businesses and critical infrastructure from coastal flood and erosion risk) that would be less damaging to European sites. Furthermore, the NSSMP also demonstrated IROPI and that an adequate mechanism (i.e. the Solent and South Downs HCRP) is in place to compensate for these intertidal habitat losses.
- 6.6 The Secretary of State agreed with the assessment presented in the NSSMP HRA and approved the NSSMP for adoption. **Because an adequate mechanism for compensation is already in place and this has been approved by the Secretary of State, it follows that a separate derogation for the HICMS regarding intertidal habitat loss is not required as no additional intertidal losses are projected beyond those already approved for the NSSMP.** Effectively, the decision to adopt a Hold the Line policy along the relevant Hayling Island frontages has already been assessed and compensated for at a higher tier in the planning framework. Moreover, the HICMS AA also shows that the implementation of the proposed policies within the HICMS will reduce the losses of saltmarsh and mudflats, thereby representing an improvement over the impacts identified at the NSSMP level.

## Direct SAC and SPA / Ramsar Habitat Loss and Gain – Supralittoral Habitat

- 6.7 Adverse effects of the HICMS on the Solent Maritime SAC regarding designated vegetated shingle (annual vegetation of drift lines and perennial vegetation of stony banks) habitat loss could not be excluded in the AA. As such, this impact pathway is carried forward to the derogation (No Alternatives, IROPI and compensation) stage.

### No Alternatives

- 6.8 The Hold the Line policies in ODU 8, ODU 10, ODU 11, ODU 13 and ODU 15 will result in the direct loss of seaward vegetated shingle over the 100 years of the HICMS. Therefore, it must be appraised whether there are reasonable alternatives delivering the same objectives, which are less damaging to the Solent Maritime SAC (i.e. which would reduce the extent of loss of these habitats). Reasonable alternatives would also include those that are technically and / or economically more challenging than the one being proposed. It is to be noted that a Hold the Line management approach for Hayling Island was adopted under the approved NSSMP and the HICMS predominantly maintains this approach in ODUs with seaward vegetated shingle. However, in ODU14, where vegetated shingle would have been lost under the approach set by the NSSMP, the HICMS proposes No Active Intervention. This is positive for the Solent Maritime SAC because it results in the retention of 0.59ha of vegetated shingle that otherwise would have been lost under the NSSMP policy.
- 6.9 The iterative OAR undertaken by AECOM, encompassed a robust assessment of management options and resulted in Leading Options being chosen for all ODUs. Multi-criteria analyses of a range of management approaches in each ODU were conducted, comparing categories such as technical feasibility, economic cost-benefit ratio, environmental benefits and the scope to deliver social needs. By their nature, these targets are sometimes conflicting, requiring the prioritisation of one target over another. For example, a Hold the Line approach may be the only means of protecting housing or critical employment infrastructure but would inevitably result in the loss of vegetated shingle (where present) seaward of hard coastal defences. **Table 8** summarises key management approaches assessed for ODUs 8, 10, 11, 13 and 15 in the OAR. Specifically, the

leading FCERM option is contrasted with the Do Nothing scenario, the latter being the preferential hypothetical approach to minimise vegetated shingle loss. In all cases, the Hold the Line scenarios score significantly higher than the Do Nothing scenario, primarily due to the significant social and economic costs associated with an undefended coastline in these ODUs.

**Table 8: Summary of management approaches considered in the OAR for ODUs where Hold the Line is projected to lead to vegetated shingle loss.**

ODU	Management Approach	Commentary
ODU 8	Do Nothing (Score = -4) Sustain 0.5% AEP – Rock revetment / floodwall / setback floodwall (Score = 3.5)	Do Nothing associated with negative economic and social impacts due to flooding and coastal erosion to communities, whereas Hold the Line protects assets and enables beach access.
ODU 10	Do Nothing (Score = -5) Resilience (property-level flood protection) and maintenance of existing frontline defences (Score = 1)	Do Nothing associated with negative economic and social impacts due to flooding and coastal erosion to communities, whereas Resilience and maintenance of frontline defences provide property-level protection and economic advantages.
ODU 11	Do Nothing (Score = -4) Sustain 1.33% AEP (Score = 4)	Do Nothing associated with negative economic and social impacts due to flooding and coastal erosion to communities, whereas Hold the Line protects assets.
ODU 13	Do Nothing (Score = -4) Sustain from 2021 0.5% AEP (Score = 2)	Do Nothing associated with negative economic and social impacts due to flooding and coastal erosion to communities, whereas Hold the Line is economically advantageous, protects critical assets and allows long-term maintenance of the Hayling Island Billy Trail.
ODU 15	Do Nothing (Score = -4) Sustain 0.5% AEP – setback defence (Score = 6)	Do Nothing associated with negative economic and social impacts due to flooding and coastal erosion to communities, whereas Hold the Line is economically advantageous, protects critical assets and allows long-term maintenance of the Hayling Island Billy Trail. Critical environmental advantage by protecting the historic landfill from flooding and coastal erosion.

6.10 The Hold the Line policies proposed for ODU 8, ODU 10, ODU 11, ODU 13 and ODU 15 meet two key objectives of the HICMS, including a reduced flood and erosion risk to human assets, and the support of sustainable development on Hayling Island. Clearly, to achieve the long-term protection of homes and businesses immediately adjoining the coastline, there is no feasible alternative to holding the line with hard engineering solutions. This approach is in line with the position of Natural England and the Chichester Harbour Conservancy, which deem Hold the Line approaches acceptable where they directly protect homes or critical infrastructure. Overall, it is considered that there is No Alternative to a Hold the Line approach in these ODUs that would achieve the protection of human assets from coastal flooding and erosion due to the predicted sea level rise.

## IROPI

6.11 Plans and projects for which adverse effects on site integrity cannot be excluded and there are no less damaging alternative solutions, must also demonstrate IROPI. Delivering Hold the Line policies is associated with several IROPI as outlined by the Department for Environment, Food and Rural Affairs in their guidance on the application of article 6(4). For example, maintaining and raising flood defences in line with projected sea level rise is the only mechanism through which critical infrastructure such as homes and businesses can be protected. This target fulfils all three elements of IROPI, including being imperative (it is necessary to protect human assets), overriding (the maintenance of human infrastructure is of paramount importance, provided that adequate ecological compensation can also be delivered) and of public interest (the preservation of social and economic function represents a public good rather than serving solely private interests). Specifically, a guidance note published by the Chichester Harbour Conservancy (CHC) in cooperation with Natural England<sup>78</sup>, states that Hold the Line policies are permissible where they provide critical protection of buildings and infrastructure, which is clearly the case for ODU 8, ODU 10, ODU 11, ODU 13 and ODU 15. As highlighted in a guidance document by the European Commission, a requirement which would have been incorporated in British law post-Brexit, any public interest should also apply over the long-term. The HICMS satisfies this criterion by addressing flood and coastal erosion risk over the next 100 years.

6.12 IROPI can occur at national, regional and local levels. However, in practice, plans, strategies and projects are more likely to meet IROPI if they are enacting or are consistent with national strategic plans and / or policies. The National FCERM Strategy<sup>79</sup> published by the Environment Agency sets out the government's policy to flooding and erosion risk management and provides the framework within which all risk management authorities must deliver their management approaches. The National FCERM Strategy promotes a broad range of resilience actions that include better protection from flooding and coastal change. Building and maintaining strong defences to protect essential infrastructure at risk from flooding is a key resilience action included in the National FCERM Strategy. It highlights that this approach should incorporate the following examples, two of which are clearly key elements of the Hold the Line policies in the HICMS:

- Build flood and coastal defences to provide an appropriate standard of protection;
- Ensure that such defences operate reliably and perform as expected when exceeded; and
- Deploy demountable barriers where permanent defences are unfeasible.

## Compensation

6.13 The AA in **Section 5** indicates that the HICMS is predicted to lead to the loss of 2.62ha of vegetated shingle over the strategy period. It follows that adequate compensation for this habitat loss will need to be provided to obtain consent for adoption. While the precise details of the compensation delivery will be finalised at the individual scheme levels, the HICMS must demonstrate that compensation is realistically achievable. Generally, it should be noted that this

<sup>78</sup> Chichester Harbour Conservancy. (December 2021). Guidance Notes for a Works Licence and Application Form. 5pp. Available at: [https://www.conservancy.co.uk/assets/files/cms\\_item/135/d-CHC\\_Works\\_Licence\\_Form\\_REV1-igbMVMF2ab.pdf](https://www.conservancy.co.uk/assets/files/cms_item/135/d-CHC_Works_Licence_Form_REV1-igbMVMF2ab.pdf) [Accessed on the 03/03/2023]

<sup>79</sup> Available at: <https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england--2> [Accessed 03/03/2023]

HRA has been precautionary in that a range of mapping sources of vegetated shingle surrounding Hayling Island were considered. In contrast, the 34.29ha of vegetated shingle identified at the time of designation are probably an underestimate of this habitat within the SAC. Therefore, the proportion of qualifying shingle lost due to the HICMS is likely to be considerably smaller than the 8% reported in the AA.

- 6.14 In some ODUs, the HICMS adopts Hold the Line policy approaches along entire lengths of shoreline, although these are unlikely to materialise in all relevant areas at the scheme level. For example, the policy for ODU 8N specifies the construction, maintenance and raising of new defences (flood walls, crest raising and setback flood walls) to keep pace with sea level rise. Whilst this will be clearly necessary to protect essential infrastructure (e.g. Eastoke Avenue and Wittering Road), it is less likely that flood walls will be employed at Sparkes Marina and Black Point solely for the protection of a private sailing club.
- 6.15 The policy intent in ODU 8S is to maintain a healthy beach alongside flood and erosion protection to residents, the community and businesses at Eastoke. A combination of beach management, rock groynes and new defences will be utilised to achieve this. In their role as soft engineering solutions, beach management techniques can be employed to counteract vegetated shingle loss. Depending on design parameters (e.g. volume, width and elevation), management techniques can be tailored to prevent the loss of or provide opportunities for the colonisation of new shingle habitat. More detailed design specifications are unavailable at the HICMS level and will be developed by individual schemes. However, there is realistic scope for providing vegetated shingle compensation in ODU 8S.
- 6.16 Beach management techniques in ODU 10S are ongoing and will counteract the predicted loss of vegetated shingle along this section of shoreline. Indeed, a recent Vegetated Shingle Monitoring Report<sup>80</sup> highlights that extraction and replenishment operations in this ODU are not having a deleterious impact on this habitat in this locale. In fact, monitoring of vegetated shingle between 2016 and 2022 shows a year-on-year increase in the amount of 'perennial vegetation of stony banks' from 3.7ha to 5.61ha<sup>81</sup>. These data indicate that there currently is natural accretion of shingle habitat at Gunner Point of approx. 0.5ha per annum. According to erosion zones there is likely to be beach accretion at Gunner Point up to 2071, when the beach will return to erosion following the cessation of active beach management.
- 6.17 The management in ODU 15 intends to adapt to rising tides, maintaining the viability of the HIBT and the community at Stoke, while creating a more sustainable defence alignment into the future. This will involve the creation of a setback defence and, therefore, the opportunity for vegetated shingle to retreat inland. While the modelling data reported in the AA still predict 1.33ha vegetated shingle loss for this ODU (and this has been used in line with the precautionary approach), it is impossible to predict how this area will evolve over time given the eroding shoreline. For example, the beach level may change as erosion progresses, providing opportunity for vegetated shingle to re-establish itself atop the receding shoreline. While there is considerable uncertainty, there is at least some scope for the overall vegetated shingle loss to be buffered in ODU 15.
- 6.18 In ODUs where No Active Intervention or Managed Realignment are proposed, there is the potential for bespoke creation of vegetated shingle. Generally, it is considered that this habitat is difficult to recreate due to its dynamic nature and inhospitable characteristics for plant growth. Plants experience high temperature stress and desiccation in summer, while winter brings saltwater spray, high winds and substrate movement. Shingle substrate contains little organic matter and is inherently nutrient poor. Vegetated shingle may be created within immediate proximity to the mean high-water spring tide. Suitable species for vegetated shingle communities are sea kale, sea holly, sea campion, biting stonecrop, English stonecrop, viper's bugloss, rock samphire and yellow-horned puppy. Pot planting should take place in March / April to give plants time to establish themselves prior to summer desiccation. Generally, the substrate, aspect and slope of the shoreline should be varied to maximise the number of species that can successfully establish. Because perennials are too slow to colonise and easily disturbed, these species must be established in the form of container-grown plants (9cm or more). Shingle habitat should contain roughly 20% sand (especially where plants are grown from seed) and be at least 20cm

<sup>80</sup> Coastal Partners. (July 2022). South Hayling Beach Management Plan – Beach Management Activities Vegetated Shingle Monitoring Report for Gunner Point, Hayling Island, Hampshire. 14pp.

<sup>81</sup> By contrast, no discernible trend is evident for 'annual vegetation of drift lines', which is a much more dynamic habitat.



deep. The texture of the habitat matrix should be varied, such that the opportunity for colonisation is maximised. In the construction period, vegetated shingle areas should be shielded from public access and boardwalks are advised to protect the habitat from trampling damage once established. Further guidance on the creation of coastal vegetated shingle is available in various literature sources (e.g. <sup>82</sup>).

- 6.19 When delivering compensation for the loss of vegetated shingle, it should be noted that each site would have developed under unique environmental conditions. The geological origin and process of shingle bank formation is an important determinant of the vegetation community type that develops. Most deposits are deposited by tidal processes that distribute eroded material along the coastline by long-shore drift. To adequately compensate for stretches of vegetated shingle that are anticipated to be lost, it is essential to have detailed local ecological knowledge (e.g. of species composition, tidal and exposure conditions, etc.). Any replacement shingle would need to be delivered in locations with similar abiotic conditions to ensure that the characteristic plant assemblage is able to establish itself and is ecologically functional.
- 6.20 Since the loss of shingle is incremental and cumulative over the 100 years of the HICMS it may also be possible, particularly for the perennial vegetation of stony banks that site above the high-tide line to physically translocate the upper surfaces of the shingle, including propagules and roots of perennial vegetation, to replacement locations along the frontage, at a point in the future before inundation occurs and the habitat is lost in its existing position. In the author's experience this has been successfully undertaken for inland shingle (e.g. vegetated railway ballast and similar) where an interesting flora has developed.

## Conclusion

- 6.21 It is not possible for the HICMS HRA itself to identify precise locations and quantities for vegetated shingle habitat compensation. The opportunities for compensation will therefore be refined post-adoption of the HICMS as individual planning proposals in different ODUs are progressed. A worst-case scenario is that a total of 2.62ha of vegetated shingle will need to be compensated for over the 100 years of the HICMS through a combination of management interventions and natural shoreline accretion processes. Notwithstanding this, discussion of the above ODUs indicates that this compensation can be delivered through adequate management in the relevant sections of shoreline.

## Direct SPA / Ramsar Habitat Loss – Landward (Coastal Grazing Marsh and Freshwater) Habitat

- 6.22 Adverse effects of the HICMS on the Chichester and Langstone Harbours SPA / Ramsar regarding landward coastal grazing marsh and freshwater habitat loss could not be excluded in the AA. As such, this impact pathway is carried forward to the derogation (No Alternatives, IROPI and compensation) stage.

## No Alternatives

- 6.23 The Managed Realignment approaches in ODU 3 and ODU 5B will result in the direct loss of SPA / Ramsar landward habitat over the 100 years of the HICMS. Therefore, it must next be considered whether there are reasonable alternatives delivering the same objectives, which are less damaging to the Chichester and Langstone Harbours SPA / Ramsar. Reasonable alternatives would also include those that are technically and / or economically more challenging than the one being proposed. It is to be noted that the Managed Realignment proposed in these ODUs represents a deviation from the overarching NSSMP, such that the requirement for derogation stems entirely from the HICMS.
- 6.24 AECOM's iterative OAR undertook a thorough and robust option selection process for both ODU 3 and ODU 5, including long-list and short-list appraisals, leading to Leading Options being selected for inclusion in the HICMS. Final Leading Options were selected on the basis of a multi-

<sup>82</sup> Brighton & Hove City Council. (June 2022). Biodiversity and Nature Conservation Supplementary Planning Document 11 Annexes. 47pp. Available at: [https://www.brighton-hove.gov.uk/sites/default/files/2022-08/BNC%20SPD%20Annexes%20FINAL\\_.pdf](https://www.brighton-hove.gov.uk/sites/default/files/2022-08/BNC%20SPD%20Annexes%20FINAL_.pdf) [Accessed on the 02/03/2023]

criteria analysis, accounting for technical feasibility, environmental benefits and impacts, economic assessments (e.g. incremental Benefit-Cost Ratios) and stakeholder engagement. Each short-listed option was scored in four key categories, including technical, economic, environmental and social. The multi-criteria appraisals for ODU 3 and ODU 5B show that the Leading Options (i.e. the ones proposing Managed Realignment) have the highest environmental and overall scores. In both ODUs the high environmental scores stem from environmental benefits delivered through intertidal habitat creation. Overall, the proposed Managed Realignment in ODU 3 and ODU 5B is the least damaging solution for delivering the main objectives of the HICMS, including human asset protection and intertidal habitat creation.

- 6.25 The Managed Realignment approaches in ODU 3 and ODU 5B are proposed to meet three key objectives of the HICMS, including reducing flood and erosion risk to human assets, working towards a holistic solution that benefits people and nature, and supporting sustainable development on Hayling Island. Clearly, regarding intertidal habitat creation there are no alternatives to setting back flood defences and allowing the sea to inundate land that was previously defended. This aligns with Natural England advice on previous project proposals in the Chichester and Langstone Harbours SPA / Ramsar, which advocates sustainable management rather than Hold the Line approaches. In the Chichester and Langstone Harbours SPA / Ramsar, Natural England and Chichester Harbour Conservancy have adopted the position that they will not consent Hold the Line approaches where the defences are only defending farmland and landward grazing / roosting sites and not directly protecting homes or critical infrastructure.
- 6.26 Overall, it is considered that there are No Alternatives to delivering the desired positive outcome for nature, while also protecting human assets from flooding and erosion due to rising sea levels.

## IROPI

- 6.27 Plans and projects for which adverse effects on site integrity cannot be excluded and there are no less damaging alternative solutions, must also demonstrate IROPI. Compared to the overarching NSSMP, the HICMS represents a deviation in shoreline management from Hold the Line to Managed Realignment in ODU 3 and ODU 5B. Given this, some landward wader roosting and wildfowl foraging sites that form part of the SPA / Ramsar designation are projected to be lost. Importantly, Managed Realignment is proposed explicitly to create intertidal habitat to compensate for coastal squeeze losses (another impact pathway associated with this and other coastal strategies) from Sustain (Hold the Line) policies proposed for other ODUs within the HICMS.
- 6.28 The creation of intertidal habitat is a legal requirement of the NSSMP and, therefore, also required to support of the delivery of the Solent and South Downs FCERM capital programme. Without additional intertidal habitat becoming available, other FCERM schemes in the area, both on Hayling Island and the wider Solent, will not be able to proceed and protect homes, businesses and critical infrastructure. Coastal defence schemes that encompass Hold the Line policies would not be able to draw upon sufficient compensatory intertidal habitat, meet the statutory HRA requirements and secure planning permission / marine licence.
- 6.29 Overall, delivering Managed Realignment is associated with several IROPI as outlined by the Department for Environment, Food and Rural Affairs in their guidance on the application of article 6(4). For example, setting back flood defences will ensure public safety while also delivering beneficial consequences of primary importance to the environment. These rationales fulfil all three elements of IROPI, including being imperative (they are necessary to protect human assets and delivering ecological benefits), overriding (Natural England considers the creation of intertidal habitat comparatively more important than defending landward roosting and foraging habitats) and of public interest (the preservation of human assets and ecological integrity delivers a public good rather than serving solely private interests). Specifically, a guidance note published by the Chichester Harbour Conservancy (CHC) in cooperation with Natural England<sup>83</sup>, states that Hold the Line policies not directly protecting buildings or infrastructure from flooding will likely be refused and Managed Realignment should be prioritised. In their Sustainable Shorelines

<sup>83</sup> Chichester Harbour Conservancy. (December 2021). Guidance Notes for a Works Licence and Application Form. 5pp. Available at: [https://www.conservancy.co.uk/assets/files/cms\\_item/135/d-CHC\\_Works\\_Licence\\_Form\\_REV1-igbMVF2ab.pdf](https://www.conservancy.co.uk/assets/files/cms_item/135/d-CHC_Works_Licence_Form_REV1-igbMVF2ab.pdf) [Accessed on the 24/08/2022]

document<sup>84</sup>, CHC also clarify their order of preference of shoreline management approaches, which places Managed Realignment ahead of Hold the Line. As highlighted in a guidance document by the European Commission, a requirement which would have been incorporated in British law post-Brexit, any public interest should also apply over the long-term. The HICMS satisfies this criterion by addressing flood and coastal erosion risk over 100 years.

- 6.30 IROPI can occur at national, regional and local levels. However, in practice, plans, strategies and projects are more likely to meet IROPI if they are enacting or are consistent with national strategic plans and / or policies. The National FCERM Strategy<sup>85</sup> published by the Environment Agency sets out the government's policy to flooding and erosion risk management and provides the framework within which all risk management authorities must deliver their management approaches. One of the objectives of the National FCERM Strategy is to create climate-resilient places, illustrated by the Environment Agency's commitment to the national Habitat Compensation and Restoration Programme and which has created over 900ha of intertidal compensatory habitats since the early 2000s. The National FCERM Strategy sets out that adaptive coastal management approaches are to be delivered, a key component of which is Managed Realignment. One of the measures included in the National FCERM Strategy is to collaboratively deliver adaptive interventions that also encompass wider environmental objectives. The HICMS protects critical human assets and delivers key environmental gains in ODU 3 and ODU 5, thus being aligned to the overarching National FCERM Strategy. While accepting that a relatively small extent of landward SPA / Ramsar roosting and foraging habitats would be lost, the additional area of intertidal habitat created would encompass significant ecological and environmental value.

## Compensation

- 6.31 Given that adverse effects on the Chichester and Langstone Harbours SPA / Ramsar due to loss of landward coastal grazing marsh and freshwater habitats cannot be avoided and there are IROPI, compensation for this habitat loss will be required. Habitat compensation should cover the habitat loss across all three epochs of the HICMS, noting that future iterations / refresh of the NSSMP will need to undertake updated modelling (accounting for the latest LiDAR data and sea level rise projections) that will likely change habitat loss projections for epochs 2 and 3. However, using the latest evidence base available, 40.19ha of landward SPA / Ramsar habitats will be lost, including 39.91ha of coastal grazing marsh and 0.28ha of freshwater habitat. Therefore, replacement habitat will be required to compensate the loss predicted across the three epochs of the HICMS. The habitat compensation process should consider the current functional importance that supporting habitat at risk holds for SPA / Ramsar birds, including factors such as habitat, topography, disturbance, area and shape<sup>86</sup>.
- 6.32 The HCRP is the Government's agreed mechanism for delivering strategic habitat compensation as a result of FCERM approaches and, in the Solent and South Downs area, is coordinated collaboratively by the Environment Agency and Coastal Partners. The landward habitat types that are relevant to the Management Realignment policies in the HICMS are the same habitat types that are considered in the NSSMP and Solent and South Downs HCRP, namely coastal grazing marsh and freshwater habitats. This aligns the HICMS and NSSMP HRAs and allows for transparent tracking of habitat compensation requirements. The HCRP balance sheet will need to be updated accordingly to ensure that the additional compensation requirements due to implementation of the HICMS are captured in the HCRP targets.
- 6.33 Since the strategic habitat compensation targets for the Solent and South Downs HCRP were derived from the NSSMP AA, two schemes (Medmerry Managed Realignment Scheme and Manor House Farm) have been progressed, resulting in reduced outstanding habitat requirements. Over the three epochs covered by the HCRP to 2105, the current HCRP balance sheet indicates that only intertidal mudflats and saltmarsh are associated with a predicted

<sup>84</sup> Chichester Harbour Conservancy. (2016). Chichester Harbour Area of Outstanding Natural Beauty – Sustainable Shorelines General Guidance First Edition. 44pp. Available at: [https://conservancy.co.uk/assets/files/cms\\_item/135/d-Sustainable\\_Shorelines\\_First\\_Edition-T6Q1c9qWFb.pdf](https://conservancy.co.uk/assets/files/cms_item/135/d-Sustainable_Shorelines_First_Edition-T6Q1c9qWFb.pdf) [Accessed on the 24/08/2022]

<sup>85</sup> Available at: <https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england--2> [Accessed 27/10/2022]

<sup>86</sup> SWBGS Steering Group. (October 2018). Solent Waders and Brent Goose Strategy – Guidance on Mitigation and Off-setting Requirements. 15pp. Available at: <https://solentwbgs.files.wordpress.com/2021/03/swbgs-mitigation-guidance-oct-2018.pdf> [Accessed on the 05/01/2023]

shortfall<sup>87</sup>. Notably, coastal grazing marsh and freshwater habitats, the landward habitats lost due to Managed Realignment in ODU 3 and ODU 5, are identified as having a surplus of 69ha and 17ha respectively. However, the current balance sheet does not include predicted losses of coastal grazing marsh and freshwater habitats from the delivery of future intertidal habitat compensation schemes in the HCRP delivery pipeline. The forecast balance sheet for the Solent and South Downs HCRP (available in the 2019 / 2020 report<sup>88</sup>) indicates a significant future deficit of coastal grazing marsh habitat in epochs 2 and 3 due to the knock-on effects to landward designated habitats from intertidal habitat creation schemes. Furthermore, the forecast HCRP balance sheet does not include predicted losses of coastal grazing marsh and freshwater habitats from the delivery of the managed realignment policies proposed within the HICMS at ODU 3 and ODU 5B. It is also essential to consider functional requirements of birds using the landward habitats at ODU 3 and ODU5, not just extents of habitats, as compensation for losses should be delivered as close as possible to the location of the impact.

- 6.34 During the development of detailed designs for Managed Realignment at ODU 3 and ODU 5B, the schemes will aim as far as possible to re-create any required landward compensatory habitat and / or bird high tide roosting / feeding mitigation habitat within the scheme boundary. Habitat creation schemes (such as at Tournerbury Farm) will need to be carefully designed to include islands to provide bird roost function within and wetland areas for foraging adjacent to newly created intertidal habitats. This will help to minimise knock-on effects from intertidal habitat creation on the coastal grazing marsh and freshwater HCRP targets, as well as creating sites that have good transitional habitats and support healthy functioning estuarine systems.
- 6.35 Furthermore, the Solent and South Downs HCRP is developing a business case to undertake a strategic coastal grazing marsh study to identify and prioritise potential sites for the creation of new coastal grazing marsh and bird high-tide functionally linked sites to ensure the integrity of the Solent European sites and ensure that the HCRP maintains a viable delivery plan in order to meet the legal requirements of the NSSMP and coastal strategies. This study will include consideration of suitable location(s) for coastal grazing marsh habitat to ensure it will meet both the functional requirements of SPA / Ramsar birds as well as meeting the Ramsar / SSSI habitat requirements.

## Conclusion

- 6.36 Overall, the preceding sections have demonstrated that the Managed Realignment proposals in ODU 3 and ODU 5B have no less damaging alternative solutions and there are IROPI. Furthermore, compensation for the identified SPA / Ramsar landward habitat loss can be delivered within careful design of the managed realignment schemes themselves and / or via the Solent and South Downs HCRP. **It is considered that adequate landward coastal grazing marsh and freshwater habitat compensation can be achieved in principle and, therefore, the HICMS is in accordance with the requirements of the Habitats and Species Regulations 2017 (as amended) and can be adopted.**
- 6.37 Given that the strategic compensation mechanism (the HCRP) is secured, the overall coherence and function of the Chichester and Langstone SPA / Ramsar in terms of foraging and resting habitats will be maintained. In conclusion, permission for adoption of the HICMS may be granted under Regulation 64(1) of the Conservation of Habitats and Species Regulations 2017 (as amended).

<sup>87</sup> Coastal Partners (2021) Solent and South Downs Regional Habitat Compensation Programme: Review Report 2019 & 2020. Available at: [https://southerncoastalgroup-scopac.org.uk/wp-content/uploads/2021/09/SSD-RHCP-Annual-Review-Report-2019-2020\\_Final\\_20-09-2021\\_v1.1.pdf](https://southerncoastalgroup-scopac.org.uk/wp-content/uploads/2021/09/SSD-RHCP-Annual-Review-Report-2019-2020_Final_20-09-2021_v1.1.pdf) [Accessed 27/10/2022]

<sup>88</sup> Ibid.

## 7. Conclusions and Recommendations

- 7.1 The AA in Chapter 5 appraised whether the HICMS has the potential to result in adverse effects on the site integrity of the Chichester and Langstone Harbours SPA / Ramsar and Solent Maritime SAC. It specifically focussed on the following impact pathways for which LSEs could not be excluded in the HRA Screening Report undertaken by Coastal Partners:
- Direct SAC and SPA / Ramsar habitat loss – Intertidal (littoral) habitats
  - Direct SAC habitat loss – Vegetated shingle (supralittoral) habitat
  - Direct SAC and SPA / Ramsar habitat loss – Subtidal habitats
  - Direct SPA / Ramsar habitat loss – Landward coastal grazing marsh and freshwater habitats
  - Loss of functionally linked habitat (SWBGS sites)
  - Changes to coastal hydrogeomorphic processes (sediment transport and accretion / erosion patterns)
  - Recreational disturbance to SPA / Ramsar and SAC features
  - Erosion, flooding and disturbance of potentially contaminated land
- 7.2 Adverse effects of the HICMS on the integrity of the Chichester and Langstone Harbours SPA / Ramsar and Solent Maritime SAC regarding coastal processes, recreational pressure and erosion / flooding of contaminated land could be excluded for a range of reasons. For example, the HICMS proposes no increase in the number or areal extent of cross-shore structures (e.g. groynes) that could impact longshore sediment transport. Moving the HIBT inland from its current location within part of ODU14 is unlikely to significantly impact the Chichester and Langstone Harbours SPA / Ramsar regarding disturbance and will reduce trampling pressure on SAC vegetated shingle features along this part of the frontage. Furthermore, Hold the Line approaches are adopted for all stretches of coastline at landfill sites, implying that the erosion or flooding of potentially contaminated land will not arise due to the HICMS.
- 7.3 Adverse effects of the HICMS regarding intertidal habitat loss due to Hold the Line approaches in several ODUs could not be excluded. However, these adverse effects arise due to the policy approaches set out at the NSSMP level, which have already been adequately assessed and the compensation mechanism (HCRP) secured at this higher strategic level. Moreover, due to revised coastal management approaches in ODUs 1B, 3 and 5B, the HICMS will result in a gain of 8.37ha of saltmarsh and 35.14ha of mudflats across all epochs, representing a significant positive overall change from the NSSMP predictions. While this impact pathway was taken forward to the derogation stage in accordance with the HRA stepwise approach, given that there will be no additional intertidal habitat losses above those already identified at the SMP level (and in fact additional intertidal habitat will be created), no further compensation in addition to that already identified in the NSSMP HRA and included in the HCRP balance sheet will be required. **Overall, given that the HICMS will result in no additional net loss of intertidal habitats compared to the NSSMP, it is concluded that the strategy fulfils the requirements for adoption regarding the derogation tests and can defer to the NSSMP Secretary of State derogation approval in this regard.**
- 7.4 The adoption of Hold the Line policies in several ODUs (ODU 8, ODU 10, ODU 11, ODU 13 and ODU 15) will result in the loss of vegetated shingle that is a qualifying feature of the Solent Maritime SAC. Using the 1 in 200 year extreme water level as modelled for the HICMS, it was determined that under a worst-case scenario a total of 2.62ha of vegetated shingle is anticipated to be lost over the 100 years of the strategy. Chapter 6 of this HRA showed that the Hold the Line management approaches in these ODUs clearly meet the No Reasonable Alternatives and IROPI tests, especially because they align the HICMS with the overarching national FCERM strategy regarding the protection of societal interests. Regarding compensation, while detail on the



precise location and quantities of replacement shingle habitat will need to be refined at the scheme level, there is reasonable scope for delivering the required compensation as part of management approaches in-combination with natural shoreline processes in individual ODUs (e.g. ODU 8 and ODU 10). **Overall, it is considered that the HICMS meets all three derogation tests in relation to vegetated shingle loss, satisfying the requirements for adoption.**

- 7.5 While positive for offsetting coastal squeeze impacts, Managed Realignment and Do Nothing approaches in some ODUs will result in the loss of high-tide wader and waterfowl roosting and foraging sites, some of which in ODU 3 and ODU 5 are within the SPA / Ramsar site. A total of 39.91ha of designated coastal grazing marsh and 0.28ha of freshwater habitats within the SPA / Ramsar are projected to be lost over the three epochs of the HICMS. By definition, any more than a trivial loss of designated habitat from a European site is considered to have an adverse effect on its site integrity. Therefore, in order to receive consent for adoption, the HICMS must meet three derogation tests, including No Alternative solutions, IROPI and compensation. Chapter 6 of this HRA showed the management approaches in ODU 3 and ODU 5 meet the No Less Damaging Alternative Solutions and IROPI tests. Regarding compensation, the projected SPA / Ramsar landward habitat losses will be addressed via careful design of the managed realignment schemes themselves and / or via the Solent and South Downs HCRP, which will be undertaking a strategic coastal grazing marsh study to identify sites for the creation of new coastal grazing marsh. **Overall, it is considered that the HICMS meets all three derogation tests in relation to high-tide wader and waterfowl foraging and roosting sites within the SPA / Ramsar, satisfying the requirements for adoption.**
- 7.6 Managed Realignment and Do Nothing policies were also shown to result in the likely loss of SWBGS supporting sites outside the SPA / Ramsar designation, i.e. functionally linked habitats. It is projected that six Core Areas, six Primary Support Areas, three Secondary Support Areas and one area of Low Use will be partially inundated due to setback or failing sea defences. However, a detailed assessment of the quantum of habitat loss, habitat types impacted and bird distributions within SWBGS parcels, indicate that mitigation is only required for one habitat parcel (H40B in ODU5B) to avoid adverse effects on the integrity of the Chichester and Langstone Harbours SPA / Ramsar. Mitigation should be achieved following the latest off-setting guidance published by the Solent Waders and Brent Goose Steering Group<sup>89</sup>. It is anticipated that solutions to mitigating functionally linked habitat loss will involve habitat enhancements within ODU 5B, the Tournerbury Farm habitat creation site. As the habitat creation scheme in this ODU is progressed, it will need to ensure that adequate replacement habitats are identified, safeguarded, acquired and managed in-perpetuity. **Overall, provided that the relevant statutory organisations are consulted at the earliest opportunity in habitat creation scheme design and the mitigation process, it is concluded that adequate mitigation for functionally linked habitat loss is achievable in principle.**

<sup>89</sup> Solent Waders and Brent Goose Steering Group. (October 2018). Solent Waders and Brent Goose Strategy – Guidance on Mitigation and Off-setting Requirements. 15pp. Available at: <https://solentwaders.files.wordpress.com/2021/03/swbgs-mitigation-guidance-oct-2018.pdf> [Accessed on the 21/03/2022]

# Appendix A Technical Note on Calculating Intertidal Habitat Losses and Gains



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**Project name:**  
Hayling Island Coastal Management Strategy

**Project ref:**  
60593354

**From:**  
AECOM Limited

**Date:**  
20<sup>th</sup> April 2022

**To:**  
Zara Ziauddin  
Lead Marine Advisor  
Thames Solent team  
Natural England

## Technical Note

**Subject: Hayling Island Coastal Management Strategy Habitats Regulations Assessment – Habitat Losses and Gains**

### 1. Introduction

AECOM has been commissioned by Coastal Partners on behalf of Havant Borough Council (HBC) to undertake a Habitats Regulations Assessment (HRA) to support the Hayling Island Coastal Management Strategy (herein referred to as ‘the Strategy’). The aim of the Strategy is to identify the Leading Options for the management of the flood and coastal erosion risk around Hayling Island over the next 100 years, to review and update the policies developed within the North Solent Shoreline Management Plan (SMP)<sup>90</sup>.

The objective of the HRA is to identify if the Strategy will result in Likely Significant Effects (LSEs) or adverse effects on the integrity of European sites. An initial LSEs screening exercise has already been undertaken<sup>91</sup>, therefore this stage of the HRA focuses on the Appropriate Assessment and likely compensation requirements due to habitat losses and gains resulting from the draft Strategy options. Under the Conservation of Habitats and Species Regulations 2017 (as amended), an Appropriate Assessment is required where a plan or project is likely to result in LSEs upon a European Site, either individually or ‘in combination’ with other projects. Where adverse effects are possible, the HRA is to advise on appropriate policy mechanisms and approaches for delivering mitigation. Should potential adverse effects on integrity be unavoidable, the HRA must also provide evidence that the applicable derogation tests are met, including No Reasonable Alternatives and Imperative Reasons of Overriding Public Interest (IROPI), and adequate compensation is being secured.

The Appropriate Assessment stage of the HRA will include an assessment of intertidal habitat loss as a consequence of coastal squeeze, a process which prevents the landward migration of important intertidal habitats such as saltmarsh and mudflats due to sea level rise. As a result, these habitats contract in size before eventually being lost. This assessment is required in areas of Hayling Island where the proposed Leading Option for coastal management is a ‘Hold the Line’ approach by establishing or maintaining a hard structure. The HRA will also include an assessment of new intertidal habitat creation, in areas where the proposed Leading Option is ‘No Active Intervention’ and/or ‘Managed Realignment’. No Active Intervention would result in existing frontline hard structures being left to fail which would allow intertidal habitat to be created landward of the existing defence line. Managed

<sup>90</sup> New Forest District Council (2010) North Solent Shoreline Management Plan. Available from: <https://www.northsolentsmp.co.uk/> [Accessed 01 April 2022]

<sup>91</sup> Coastal Partners (2020) Hayling Island Coastal Management Strategy 2120 – Habitats Regulations Assessment – Screening Report.

Realignment would result in new defences built setback from the current defence line and the creation of new intertidal habitat seaward of these new defences. Similarly the Appropriate Assessment stage of the HRA will include an assessment of the loss of designated and functionally linked landward habitats, such as coastal grazing marsh, grasslands, reedbeds and arable land, in areas where the proposed Leading Option is 'No Active Intervention' and/or 'Managed Realignment'.

The SMP has already been subject to HRA and the derogation tests. It was concluded that adverse effects on the integrity of European sites in the North Solent regarding intertidal and landward habitat loss could not be excluded. As part of the SMP approval process, it has been agreed that habitat compensation for impacts arising from Flood and Coastal Erosion Risk Management (FCERM) should be delivered via the Solent and South Downs Regional Habitat Compensation Programme (HCRP)<sup>92</sup>. The HRA to be undertaken as part of the Strategy will consider the habitat losses/gains projected to occur due to the proposed Strategy Leading Options in relation to the findings of the SMP AA and the habitat compensation identified at the SMP level.

This technical note provides details of the proposed methodology for assessing intertidal habitat losses and gains in line with the HCRP, which will make use of the calculations previously undertaken as part of the SMP AA using the Solent Dynamic Coast Project (SDCP)<sup>93</sup> outputs.

Note that an assessment of potential losses of designated and/or functionally linked landward habitats, including high-tide brent goose and wader roosts as identified in the Solent Wader & Brent Goose Strategy, will also be undertaken for the Strategy HRA. However, that is not covered by this note as it will be undertaken using a different methodology. The modelling of flood and erosion risk developed as part of the Strategy will be utilised to determine which areas of designated and functionally linked landward habitats may be lost over the next 100 years.

## 2. Solent Dynamic Coast Project and SMP Appropriate Assessment

The SDCP was conducted to inform the development of the North Solent SMP, in order to comply with the requirements of the European Union Habitats and Birds Directive. It provides an assessment of the impact of climate change and coastal management decisions on the coastal habitats across the North Solent. The SDCP quantified the amount of intertidal habitat lost due to coastal squeeze and the potential intertidal habitat creation which could offset coastal squeeze over the 100-year lifetime of the SMP (2005 – 2105).

### SDCP Intertidal Habitat Loss and Coastal Squeeze

The extent of intertidal habitat losses were calculated based on 'Hold the Line' coastal management policies, by interpreting the historical aerial photography and LiDAR. Rates of saltmarsh change were extrapolated for 2025, 2055 and 2105, based on flooding of lidar at 6mm per annum, to align with the time epochs within the SMP. Outputs were compared with historical losses and projections observed from mapping historical aerial photography. This provided measured historical and projected future rates, which also accounted for environment changes (dredging, reclamation, development and pollution) and sea level rise (using the Environment Agency 2003 sea level rise predictions). Mudflat was not digitised from the historical aerial photography, as it rarely extended to Mean Low Water Springs (MLWS), although was included in the lidar flooding projections.

### SDCP Potential Intertidal Habitat Creation

The potential sites for intertidal habitat creation were derived from tidal elevation and topography using lidar data. Duration and frequency of tidal inundation in relation to land elevation and gradient are crucial factors in saltmarsh and mudflat development. As such, a theoretical approach was applied in GIS whereby the North Solent 2005 lidar data was flooded to the corresponding tidal elevations to determine the expected areas of coverage of saltmarsh and mudflat. Recent aerial photography was used to verify the extents, and this method was then used to predict potential saltmarsh and mudflat creation for 2025, 2055 and 2105. Sea level rise of 6mm per annum was included; vertical sediment accretion rates of 0mm, 3mm and 6mm were applied to all epochs to create three scenarios, with the final outputs developed on an assumption of no vertical sediment accretion in 2025, then 3mm in 2055 and 6mm in 2105.

### SMP Appropriate Assessment

<sup>92</sup> Southern Coastal Group and SCOPAC (2022) Regional Habitat Compensation Programme. Available from: <https://southerncoastalgroup-scopac.org.uk/rhcp/> [Accessed 01 April 2022]

<sup>93</sup> Channel Coast Observatory (2008) Solent Dynamic Coast Project. Available from: [https://www.northsolentsmp.co.uk/media/1968/TR011-2008-SDCP-Main-1/pdf/TR011\\_2008\\_SDCP\\_Main\\_1.pdf?m=637520059526700000](https://www.northsolentsmp.co.uk/media/1968/TR011-2008-SDCP-Main-1/pdf/TR011_2008_SDCP_Main_1.pdf?m=637520059526700000) [Accessed 01 April 2022]

The SMP Appropriate Assessment utilised the data from the SDCP. For intertidal habitat loss and coastal squeeze, calculations were based on the SDCP lidar and tidal elevation interpretation outputs for 2005, 2025, 2055 and 2105 using a sediment accretion rate of 0mm for all three epochs. Intertidal habitat loss was calculated for a 'Hold the Line' policy (where there were existing defences, up to the end of their residual life) against a 'No Active Intervention' policy. To determine potential intertidal habitat creation, the SDCP output for 2105 was used in areas where there was a proposed 'Managed Realignment' or 'No Active Intervention' policy.

### **Balancing Intertidal Habitat Loss with Potential Habitat Creation**

The habitat losses and gains were assessed spatially and temporally across the North Solent within the SMP Appropriate Assessment to determine if compensatory habitat would be needed in the future to offset coastal squeeze arising due to the coastal management policies within the SMP. As the SMP appropriate assessment identified that compensatory habitat would be required, the Solent and South Downs HCRP was developed to ensure compliance of the SMP with the Habitats Regulations.

## **3. Solent and South Downs Habitat Compensation and Restoration Programme**

The Solent and South Downs HCRP provides a strategic approach to identifying and addressing potential losses of protected habitats, including intertidal saltmarsh and mudflats, to ensure that the coastal management policies identified within the SMP are compliant with the Habitats Regulations.

Further strategic and tactical work was carried out in 2017<sup>94</sup> and 2018<sup>95</sup> to provide an update on the progress of the HCRP in the Solent and South Downs region and identify future potential intertidal habitat compensation sites. As part of the Strategic update, the calculations for intertidal habitat loss and potential intertidal habitat creation undertaken for the SDCP and SMP were reviewed. Since the SDCP and SMP appropriate assessment were undertaken, more recent LiDAR data and sea level rise predictions have become available. However, the decision was made not to undertake updated calculations for the following reasons:

- Comparing the 2003 sea level rise predictions used in the SDCP to the Environment Agency 2011 medium emission 95% scenario showed that there is only a 10cm difference in sea level rise between the two over the 100 year period of the SMP, which is within the +/-15 cm error margin of the LiDAR data;
- If the intertidal habitat loss and potential habitat creation predictions for the priority sites were re-calculated using the most recent (2014/2016) LiDAR data, they would no longer be comparable to the coastal squeeze calculations (and therefore the HCRP baseline targets) within the approved appropriate assessments and IROPI agreements for the two Solent SMPs. It is unlikely that the topography within the priority sites has changed significantly since 2005 (the baseline year used in the SDCP and the SMP appropriate assessments). Therefore, any changes in habitat estimates would reflect the change in the quality of the LiDAR data rather than any actual change in site levels.

As such, it was determined that the SDCP calculations were still valid for use in prioritising and scheduling potential habitat compensation sites for the HCRP delivery programme and for inclusion of the Environment Agency's schemes on the Medium Term Plan (MTP), now known as the Capital Investment Programme (CIP). Each potential habitat compensation site will have its own detailed topographic survey and modelling undertaken, with habitat creation predictions refined during the scheme level assessments and option appraisal in the Operational stage of the HCRP delivery. Any further update of the SDCP calculations, and therefore HCRP baseline targets, would need to be considered as part of any future SMP refresh work to include the most up-to-date LiDAR and sea level rise predictions.

## **4. Strategy Habitats Regulations Assessment – Habitat Loss and Coastal Squeeze Methodology**

The assessment of intertidal habitat loss and coastal squeeze calculated as part of the SDCP and SMP appropriate assessment will form the basis of the assessment for the Strategy HRA. No further calculations of intertidal habitat

<sup>94</sup> Environment Agency (2018) Solent and South Downs Regional Habitat Compensation Programme: Annual Review Report 2017. Available from: <https://southerncoastalgroup-scopac.org.uk/wp-content/uploads/2019/05/SSD-RHCP-Strategic-Update-Report-2017-Final-with-appendices-compressed.pdf> [Accessed 14 April 2022]

<sup>95</sup> Environment Agency (2020) Solent and South Downs Regional Habitat Compensation Programme: Annual Review Report 2018. Available from: <https://southerncoastalgroup-scopac.org.uk/wp-content/uploads/2020/02/SSD-RHCP-Annual-Review-Report-2018.pdf> [Accessed 01 April 2022]

loss will be undertaken, as the results of the SDCP and SMP are still relevant. This will allow the Strategy to align with the overarching North Solent SMP and the HCRP baseline targets and delivery programme.

Potential intertidal habitat creation will be calculated for the Strategy using the same methodology used in the SDCP and SMP AA. A theoretical approach will be applied in GIS whereby the lidar data will be flooded to the corresponding tidal elevations to determine the expected areas of coverage of saltmarsh and mudflat. Recent aerial photography will be used to verify these extents, predicting saltmarsh and mudflat creation for 2055, 2105 and 2122 to align with the SMP epochs. This will be calculated in areas where there is a proposed policy change from SMP 'Hold the Line' to Strategy 'No Active Intervention' or 'Managed Realignment'.

As intertidal habitat losses due to coastal squeeze have been determined at the strategic SMP level, no additional compensation should be required for the Strategy given that the Leading Options are broadly in line with the policies identified within the SMP. Where changes in policy are proposed, the Strategy should be viewed as an improvement to the SMP policies regarding coastal squeeze and intertidal habitat creation. Two large areas at Northney and Tournerbury (approximately 5km frontage) are proposed to have a policy change from 'Hold the Line' to 'Managed Realignment' (subject to public consultation and subject to Environment Agency and Local Authority approvals). This could lead to an increased amount of local intertidal habitat creation in comparison to that predicted as part of the SDCP and SMP AA, thereby negating the requirement to re-calculate coastal squeeze losses.

The calculations provided within the SDCP, using the 2003 sea level rise predictions, do not require an update with more recent sea level rise predictions since the justifications provided in the HCRP 2018 report (outlined in Section 3) also apply to the Strategy. Any updates to these calculations using more up-to-date sea level rise predictions would be undertaken at the SMP HRA and Solent and South Downs HCRP level, rather than Strategy level, to maintain consistency across the North Solent SMP frontage. This should be undertaken as part the SMP refresh and will be proposed to be included in the next iteration of the SMP action plan.

## 5. Summary

The following summarises the approach to assessing intertidal habitat loss, coastal squeeze and potential intertidal habitat creation as part of the Strategy:

1. The assessment of intertidal habitat loss as a consequence of coastal squeeze provided in the SDCP and SMP appropriate assessment will provide the basis for the assessment of intertidal habitat loss for the Strategy in areas of Hayling Island which are proposed to have a 'Hold the Line' approach. No further calculations of intertidal habitat loss will be undertaken;
2. Potential intertidal habitat creation and associated landward habitat losses will be calculated for the Strategy in areas where there is proposed to be a policy change from 'Hold the Line' in the SMP to 'No Active Intervention' or 'Managed Realignment' in the Strategy;
3. The habitat losses and gains predicted as part of the Strategy will be compared qualitatively to demonstrate improvements between the SMP and the Strategy in terms of intertidal habitat gains, as well as supporting the HCRP.



# Appendix B Natural England Advice on the HICMS

Dear Hilary

Natural England recommend that for coastal strategies, including but not limited to; the Shoreline Management Plan (SMP) Refresh and Regional Habitat Creation Programme (HCRP) work, that figures for coastal squeeze and sea level rise should be based on the most recent UK Climate Projections (UKCP18)\* figures and include the mid-range figures for sea level rise. This would underpin the methodology with the latest data/evidence available.

Given the current status of the Hayling Island Coastal strategy, we are content for the strategy to rely on figures based on the Solent Dynamic Coast Project. It is noted that if they were to be recalculated using the UKCP18 figures then they would no longer be comparable to the HCRP baseline targets. In the future, it will be important for any updated strategies or plans to re-consider any impacts upon features of Natura 2000 sites in light of the latest available data/evidence.

\* Any further updated iterations to UKCP18 should also be considered.

Please refer to the following publication [here](#).

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