Assessment of Coastal Squeeze

Guidance note

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What is this document about?

This document will support anyone proposing to undertake works to coastal structures that may affect the National Site Network (Special Areas of Conservation or Special Protection Areas). It will enable users to consider the implications of coastal squeeze in Habitats Regulations Assessments and will explain how the information contained within the Shoreline Management Plans can support the assessment process.

Who is this document for?

Anyone proposing to undertake works to coastal structures within or adjacent to a Special Area of Conservation or Special Protection Area, and anyone advising on, assessing or regulating those works.

Contact for queries and feedback

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Version History

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To report issues or problems with this guidance contact Guidance Development

Contents

1. Introduction

This guidance provides a definition of coastal squeeze, informs users when a coastal squeeze assessment may be required, and explains how that assessment can be undertaken.

This document is for anyone who may need to undertake or advise on a coastal squeeze assessment or any competent authority required to take account of such information as part of a Habitats Regulations Assessment (HRA). An HRA may be required under Regulation 63 of Conservation of Habitats and Species Regulations 2017 as amended (known as the Habitats Regulations). Regulation 64 sets out the provisions for the test of alternatives and Imperative Reasons of Overriding Public Interest (IROPI) test.

Coastal squeeze may also need to be assessed to inform compliance assessments under the Water Environment (WFD) (England and Wales) Regulations 2017, and whilst this guidance note focusses on HRA, users should also consider any requirements under WFD.

The need for this guidance has arisen since Welsh Government (WG) issued a Clarification Note on the role of the National Habitat Creation Programme in 2018, further amended by their revised Clarification Note published in 2021. Prior to the publication of this advice by WG, coastal squeeze had only been considered at the plan level via the HRAs for the four Shoreline Management Plans (SMPs) wholly or partly within Wales.

Shoreline Management Plans (SMPs) set out a shared strategic approach for managing the coastline from coastal flooding and erosion risks. Their aim is to reduce the risks to people, the developed, historic and natural environments over the next century. SMPs split the coastline into small sections (called policy units) and describe how these sections will be managed over the short-term (2005-2025), medium-term (2025-2055), and long-term (2055-2105).

There are four management policies that can be applied to each policy unit, for each period of time:

- Hold the line (HTL) by maintaining or changing the existing standard of protection
- Advance the line (ATL) by building new defences on the seaward side of the original defences (although none applied in Wales)
- Managed realignment (MR) which allows the shoreline to move backwards and forwards, with management to control or limit the movement
- No active intervention (NAI) where there is no investment in coastal defences and natural processes are allowed to continue to create an evolving coastline

The HRAs of all four SMPs concluded that there would be adverse effects to the integrity of the National Site Network because of coastal squeeze habitat losses associated with ‘Hold the line’ policies. As a result of adverse effects being identified, the SMPs were subject to the tests of alternatives and Imperative Reasons of Overriding Public Interest (IROPI), and compensatory measures were required. The strategic compensation mechanism for the SMPs was identified as the National Habitat Creation Programme (NHCP), which Natural Resources Wales (NRW) delivers on behalf of WG. The NHCP

provides compensatory habitat for impacts associated with Local Authority and NRW flood and coastal erosion schemes.

The SMPs often provide further detail on specific management intent for individual policy units which complements the headline policy. For example, in a long policy unit identified as 'No active intervention' the description of the policy intent may state that there are short sections within the policy unit which are currently defended where ongoing investment could be made. Therefore, projects to invest in defences in those locations may still be in line with SMP policy, but the HRA of the SMP won't have considered the impacts of such works, because coastal squeeze impacts were only assessed in 'Hold the line' Policy units.

The 2018 WG Clarification Note required coastal squeeze to be assessed at the project level, and where necessary, project level HRAs and IROPI cases were required to be undertaken and submitted to WG for approval. The updated Clarification Note published in 2021 indicates WG's policy that coastal squeeze assessments should not be applied to maintenance activities. This guidance note aims to explain when a coastal squeeze assessment may be required in the light of WG policy.

Some works to coastal structures will be consented via Marine Licensing, Town and Country Planning, Flood Risk Activity Permits or Site of Special Scientific Interest (SSSI) consents/assents. Even without these consents, public bodies may be required to assess their own activities under the Habitats Regulations as part of their competent authority role.

This guidance therefore describes potential assessment requirements, and technical advice on how to undertake a coastal squeeze assessment for a project.

- Section 1 provides a definition of coastal squeeze, when it might occur and how to screen for potential coastal squeeze impacts.
- Section 2 sets out how to consider coastal squeeze in the context of the HRA process.
- Section 3 provides information on regulation and permitting where coastal squeeze may need to be considered.
- Section 4 provides technical advice on the assessment of coastal squeeze.
- Section 5 provides supporting information.

This guidance will be reviewed as necessary to take account of any change in policy or legislation that may lead to a change in approach to coastal squeeze assessment.

1.1 What is coastal squeeze?

A recent project, called 'What is Coastal Squeeze?' aimed to improve understanding of coastal squeeze, and to describe best practice for assessing its past and future impacts at different scales (e.g. plan level, strategy level and scheme/project level). The 'What is Coastal Squeeze?' report was commissioned by the Joint Flood and Coastal Erosion Risk Management Research and Development Programme, which is jointly overseen by Defra, the Environment Agency, NRW and the WG on behalf of all risk management authorities in England and Wales. For consistency, and where appropriate, this guidance will use and refer to the 'What is Coastal Squeeze?' report, including the definition set out below.

Definition of coastal squeeze

Coastal squeeze is 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.

It is essential this definition is read together with the points of clarification below.

Points of clarification

1. ‘Anthropogenic (man-made) structures’ includes features that act as barriers to the inland progression of marine waters and habitats. These would include flood and coastal erosion structures, quay walls and road/railway embankments. ‘Anthropogenic actions’ include activities that artificially prevent the landward transgression of habitats.

2. ‘Natural habitats’ include all relevant Annex I coastal/intertidal habitats found in the UK as defined in policy and legislation (including Natural Environment and Rural Communities Act s41 priority habitat (England) or Environment Act Section 7 for Wales). The relevant habitats will need to be identified at a site level.

3. Habitat loss is considered in terms of area of the habitat. The area should include changes arising from frontal retreat (for example, of a saltmarsh edge) as well as internal erosion (for example, expansion of creeks within marshes).

4. Coastal processes relevant to identifying coastal squeeze should include those which, under natural unconstrained conditions, can lead to the landward migration of habitats under a scenario of sea level rise - such as waves for shingle beaches, winds for aeolian dunes, and tidal inundation for saltmarshes.

5. The assessment of coastal squeeze in estuaries should consider whether the extent of any intertidal islands is affected by flood defences on the islands themselves or within the wider estuary. This consideration should also take into account the role of natural changes in channel position over time which can influence the size and location of intertidal islands.

6. Coastal squeeze as defined excludes:

    i. the historic drainage and land claim of habitat landwards of currently existing structures.

    ii. Other impacts of hard defences such as reductions in sediment supply caused by protecting eroding sediment sources or interrupting longshore transport pathways.

    iii. Impacts of other human activity/structures on habitats, such as alteration of estuary channel morphology due to dredging, training walls or piers, or impacts on habitat quality due to management practices or pollution.

iv. Other natural or human causes of habitat loss unrelated to creating barriers to landward transgression, for example, the lateral movement of channels which may be unrelated to sea level rise and, while it would erode seaward edges of habitats, would not create landward transgression even under unconstrained condition.

v. Habitat loss against natural steeply rising land (that is, sloping coastal hinterlands) – such losses may need to be considered as a baseline scenario ('without defences') against which to judge coastal squeeze losses. It should be noted that some areas of rising land formed from unconsolidated sediments may erode relatively rapidly in the future to provide accommodation space for habitats. In addition, narrow strips of higher ground which divide a low-lying hinterland from the sea may also be subject to erosion, and therefore the low-lying hinterland may provide space for habitats to develop.

The above impacts should be assessed, described and accounted for separately, even though the remedial measures may be linked or packaged with those taken to address coastal squeeze.

7. Sea level rise is taken to be the net trend in relative sea level resulting from global eustatic variations (changes in ocean volume) and regional or local isostatic change (changes in land level). Sea level rise excludes changes in water levels due to human interventions, for example, dredging, land claim, creation of flood storage/managed realignment areas. If these changes are relevant to an area, they should be assessed separately.

8. Assessing coastal squeeze should consider whether there is deterioration in habitat quality or changes in species composition which may be occurring as a result of human structures/actions impeding the landward transgression of habitats. For example, in saltmarshes, sea level rise might lead to high marsh communities being replaced with lower marsh communities. These changes may occur ahead of, or at the same time as, areal losses. See clarification point 2 above, and the 'What is Coastal Squeeze?' report for a list of coastal/intertidal habitats that need to be considered when assessing coastal squeeze.

1.2 When and where might coastal squeeze occur?

Based on the definition in section 1.1 above, coastal squeeze may occur when all of the following apply:

- Structures or coastal management activities (such as shingle re-profiling) fix the position of the coast.
- Sea-level is rising/is predicted to continue rising.
- There is a National Site Network designated site with Annex 1 habitats present seaward of the defence.
- The habitats would be able to migrate landwards if there was no coastal structure or the management activity was stopped (i.e., the land behind the defence would be susceptible to flooding if the defence failed or would be expected to erode relatively quickly). This can include land behind defences which is currently developed. This is because over the long term, it is expected that there would be degradation and then

removal of assets/structures as they become exposed to regular flooding and/or erosion, and that the land would be remediated to allow habitat to develop.

In the HRAs of the SMPs the policy units with a preferred policy of 'hold the line' were considered to have the potential to lead to coastal squeeze effects. 'No active intervention' policy units were not expected to lead to coastal squeeze effects as a result of the plans because no action was proposed. For 'managed realignment' policy units, it was not possible to undertake a coastal squeeze assessment at the plan level as details of how managed realignment might be implemented were not included. Coastal squeeze assessments were therefore deferred to the project level for managed realignment areas.

Where the proposed project, activities or scheme are within a 'hold the line' policy unit, the SMP HRAs are the best available initial source of evidence to determine whether coastal squeeze impacts were identified at the plan level (see section 5 and Annex 1 for further information). In addition, the fact that the SMP considered alternative policy options, and whether there were imperative reasons of overriding public interest to justify a 'hold the line' policy, means they can be used to support stages 3 and 4 of the HRA process at the project level (see Section 2).

For works outside a 'hold the line' policy unit, a project level assessment may be needed (see section 4), as well as provision of evidence to support stages 3 and 4 of the HRA.

1.3 Why should coastal squeeze be assessed?

Fundamentally, maintaining a particular coastal alignment whilst sea-levels continue to rise will lead to narrowing of the intertidal/coastal zone, and loss of habitat. The Habitats Regulations requires that the extent of designated Annex 1 habitats is stable or increasing. Therefore, projects or activities which prevent the natural ability of habitats to migrate landwards in response to sea-level rise are likely to lead to adverse effects or deterioration of the National Site Network.

Furthermore, coastal defences can lead to hydro morphology pressures which may prevent the achievement of good ecological status under the Water Environment (WFD) (England and Wales) Regulations 2017, or good ecological potential for water bodies classified as heavily modified. In addition to the HRA, a WFD compliance assessment will also be required, and similar evidence will be required to support both assessments. It is recommended that both assessments are undertaken in parallel. More information on how to carry out a WFD assessment is available here: Natural Resources Wales / How to carry out a Water Framework Directive (WFD) assessment for a marine licence application.

As well as complying with WG's 2021 clarification note to undertake project level assessments for relevant projects (see section 1.4, Screening Step 2), the coastal squeeze assessment is needed to inform the HRA process and check whether significant or adverse effects are likely. If a conclusion of adverse effect on site integrity is reached, the coastal squeeze assessment will also inform consideration of what is required in terms of compensatory measures (see Section 2, Stage 5)

Screening for potential coastal squeeze

Screening Step 1 – is there potential for coastal squeeze to occur?

If the answer to any of the questions below is no, no further action is required to assess coastal squeeze. If the answer to all questions is yes, then proceed to screening step 2 (section 1.4.1). This process is illustrated in Figure 1.

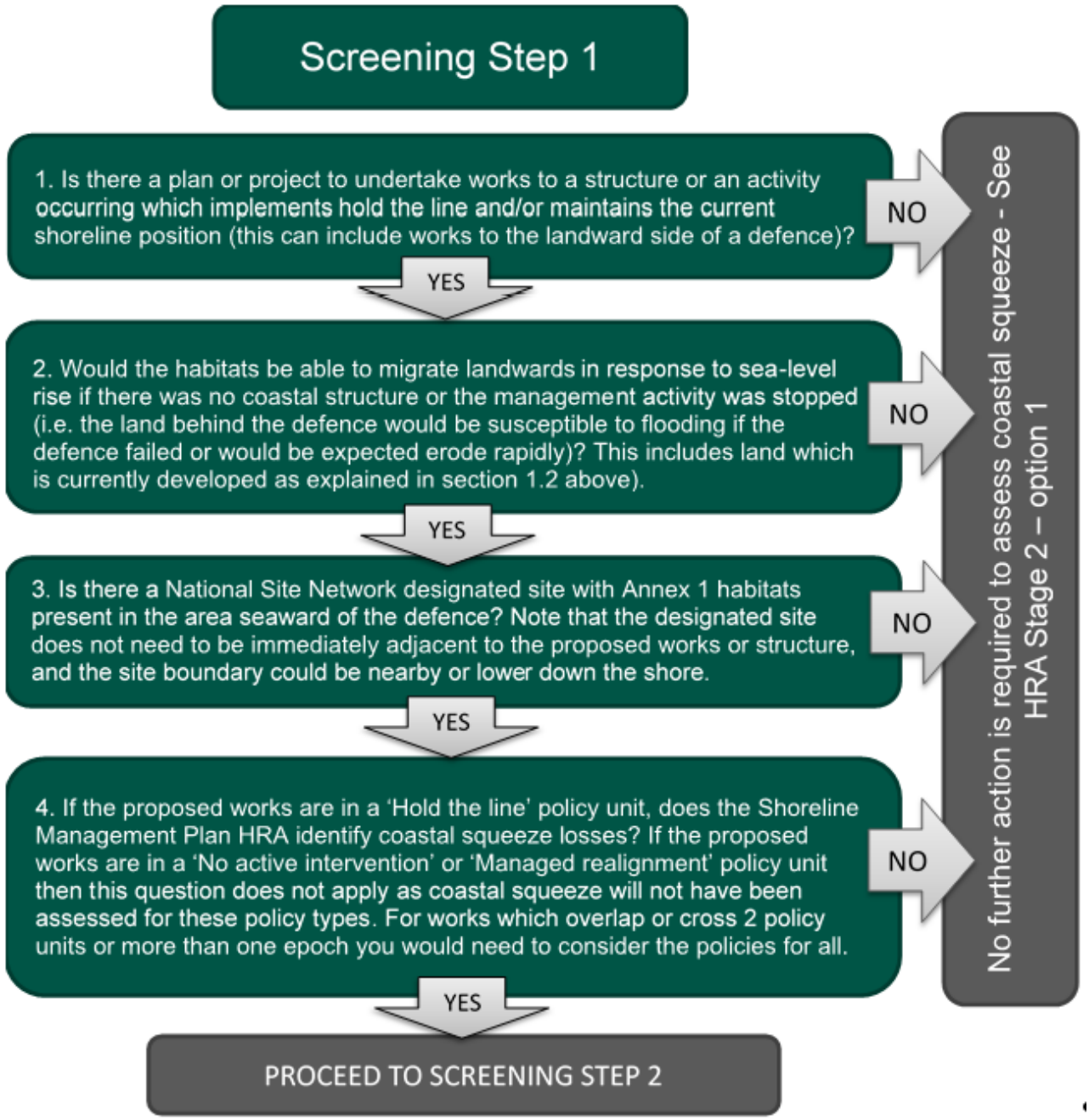
1. Is there a plan or project to undertake works to a structure or an activity occurring which implements hold the line and/or maintains the current shoreline position (this can include works to the landward side of a defence)? Note that maintenance activities are considered at screening step 2.

2. Would the habitats be able to migrate landwards in response to sea level rise if there was no coastal structure or the management activity was stopped (i.e., the land behind the defence would be susceptible to flooding if the defence failed or would be expected to erode rapidly)? This includes land which is currently developed as explained in section 1.2 above).

3. Is there a National Site Network designated site with Annex 1 habitats present in the area seaward of the defence? Note that the designated site does not need to be immediately adjacent to the proposed works or structure, and the site boundary could be nearby or lower down the shore.

4. If the proposed works are in a ‘Hold the line’ policy unit, does the SMP HRA identify coastal squeeze losses? If the proposed works are in a ‘No active intervention’ or ‘Managed realignment’ policy unit then this question does not apply as coastal squeeze will not have been assessed for these policy types. The preferred policy may change over time. Consideration should be given to the policy periods (SMP epochs) relevant to the proposed lifespan of the works. For works which overlap or cross 2 policy units or more than one epoch you would need to consider the policies for all.

Figure 1 Flow chart to illustrate Screening Step 1



Screening Step 2 – are the proposed works considered to be maintenance?

In the light of WG's 2021 Clarification Note, activities considered to fall within the definition of 'maintenance' (as set out below) are not required to be assessed for coastal squeeze at the project level. If the proposed activity falls within this definition, then this will need to be recorded in the HRA at the Test of Likely Significant Effect Stage, (see section 2, stage 2 below).

If the project is not within the definition of maintenance, this should be recorded at the Test of Likely Significant Effect Stage of the HRA, and the HRA should proceed to Stage 3: Appropriate Assessment. This process is illustrated in Figure 2.

Definition of maintenance

Maintenance works are defined as the “upkeep, repair or reasonable improvement of works”. This means the maintenance need not be like for like, but the work must not be a “significant alteration” to what is already there.

Explanation

“Reasonable improvement” and “significant alteration” within the boundary of the existing structure are not defined and will need to be considered on a case-by-case basis. See the examples provided below.

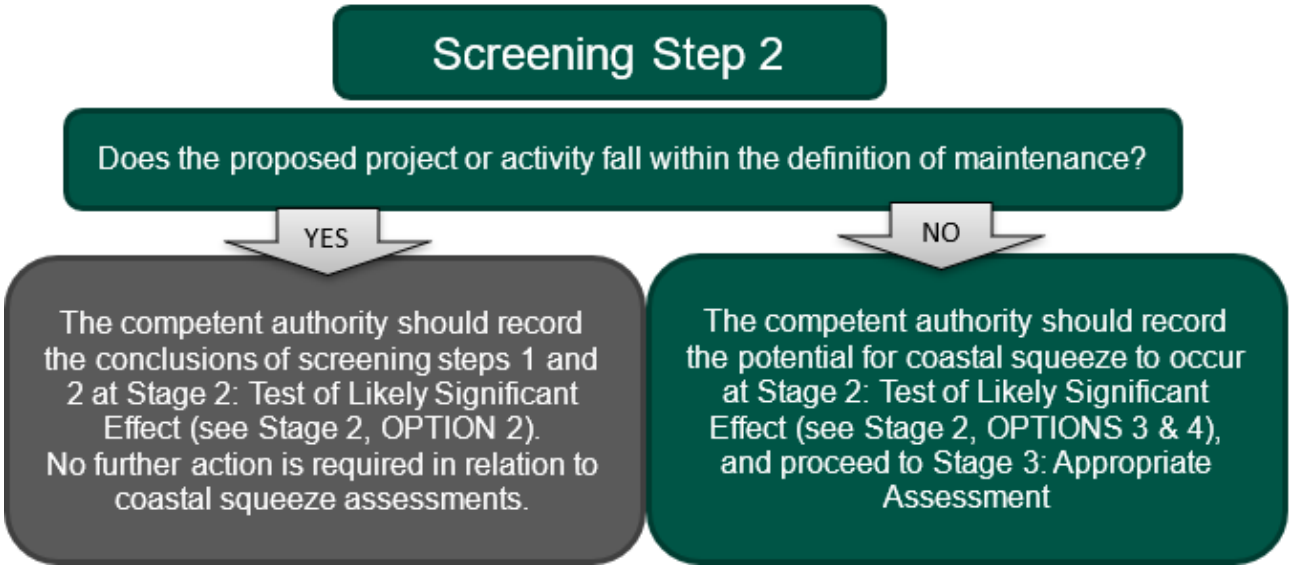
Examples of ‘reasonable improvements’ not considered to be ‘significant alternations’:

- Replacement of a timber flap valve with a steel or plastic flap valve
- Use of soil rather than peat to repair an embankment
- Repair of a sea wall or rock revetment with similar hard materials that perform the same function

Likely exclusions from ‘reasonable improvements’ which would be considered to be ‘significant alterations’

- Protection of an earth embankment with rip-rap
- Works which increase the footprint of the structure (this usually includes any works which increase the crest height of a structure)
- Extensive or complete replacement of a structure

Figure 2 Flow Chart to illustrate Screening Step 2



2. Habitats Regulations Assessments

Coastal squeeze may need to be assessed as part of a HRA for works proposed by NRW or others, for works regulated by NRW or others, and for works which NRW needs to advise on as the Statutory Nature Conservation Body. Therefore, the stages described below are intended to be generally applicable to whoever is carrying out a HRA as the competent authority, those providing the information to inform the HRA, or those advising on the HRA.

There are six stages in total, although many projects will not need to proceed beyond stages 2 or 3. Each stage includes a description and flow chart to explain what to do depending on the nature and location of the project in relation to SMP policy.

This guidance specifically applies where coastal squeeze needs to be considered. Welsh Government's website provides guidance on the HRA process in general.

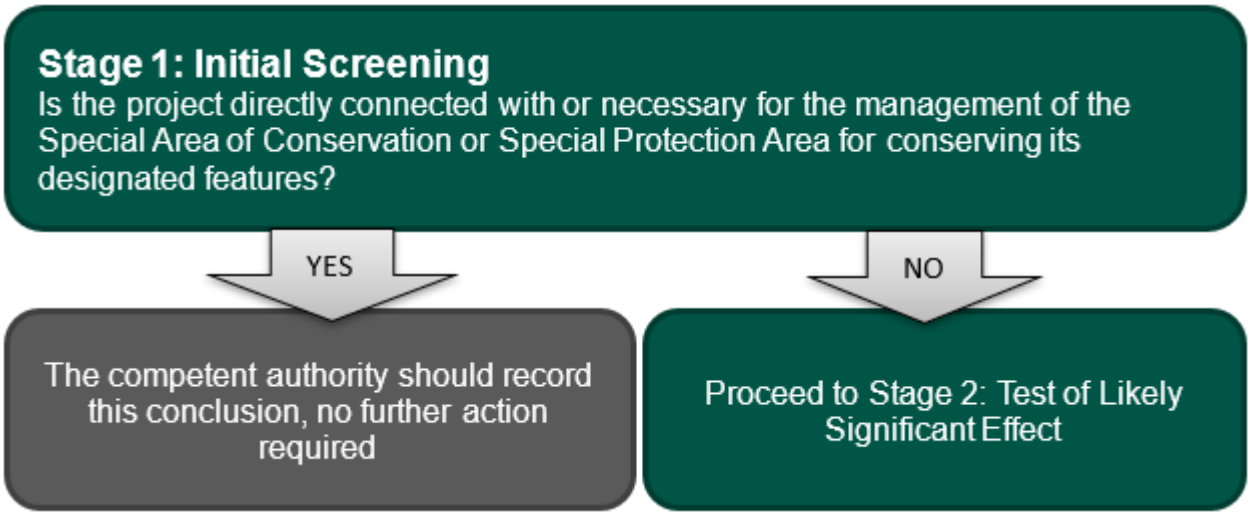
As, stated in section 1.3, in addition to the HRA, a WFD compliance assessment will be required, and similar evidence will be required to support both assessments. It is recommended that both assessments are undertaken in parallel. More information on how to carry out a WFD assessment is available here: Natural Resources Wales / How to carry out a Water Framework Directive (WFD) assessment for a marine licence application.

2.1 Stage 1

Is the project directly connected with or necessary for the management of the Special Area of Conservation or Special Protection Area for conserving its designated features?

It is likely in most instances related to works to coastal structures, and having considered the screening steps in section 1, that the answer to this will be 'no'. This process is illustrated Figure 3.

Figure 3 Flow Chart to illustrate potential outcomes at Stage 1 of the HRA



2.2 Stage 2 – Test of Likely Significant Effect

Is the project likely to have a significant effect on the designated features of the Special Area of Conservation or Special Protection Area, either alone or in combination with other plans or projects (consult appropriate nature conservation body- this is NRW in Wales)?

There are four options for this step depending on the nature and location of the proposed works illustrated in Figure 4 and explained below.

Figure 4 Flow chart to explain the options under Stage 2 (Test of Likely Significant Effect) of the HRA

Option 1 – Proposed works are not considered likely to cause coastal squeeze

If screening step 1 indicates coastal squeeze will not occur, then regardless of whether or not the proposed works fall into the definition of maintenance in screening step 2, a conclusion can be reached at this stage that there is no pathway to effect for coastal squeeze and should be recorded by the competent authority. This conclusion can be reached regardless of SMP policy.

It should be noted that the HRA may still need to proceed to stage 3 for other reasons identified at stage 2 such as construction related impacts, access, disturbance, timing, use of machinery etc. Discussion of other impacts is outside the scope of this guidance note.

Option 2 - Proposed works could lead to coastal squeeze but are considered to be maintenance, and are in a 'hold the line' policy unit

If the answers to Screening Step 1 are all 'yes' (i.e., there is the potential for coastal squeeze to occur), but the proposed works are screened out as falling within the definition of maintenance at screening step 2, then this should be recorded at this stage of the HRA. However, in line with WG policy, which applies to works which are within 'hold the line' SMP policy units, no further action is required to assess coastal squeeze within the HRA.

For works that are in 'managed realignment' or 'no active intervention' policy units, see option 4 below.

It should be noted that the HRA may still need to proceed to stage 3 for other reasons identified at stage 2 such as construction related impacts, access, disturbance, timing, use of machinery etc. Discussion of other impacts is outside the scope of this guidance note.

Option 3 - Proposed works could lead to coastal squeeze, are not maintenance, and are in a 'hold the line' policy unit

If the answers to Screening Step 1 are all 'yes' (i.e., there is the potential for coastal squeeze to occur), the proposed works do not fall within the definition of maintenance (Screening Step 2) and are within a 'Hold the Line' policy unit in the SMP, then coastal squeeze will have been assessed as part of the HRA for the SMP.

As indicated in section 1.4.1 (Screening Step 1), it is recommended that the SMP HRAs are checked to see whether coastal squeeze impacts were identified (see section 5, Supporting Information and Annex 1). If they were, then this should be recorded at this stage of the HRA with a conclusion that likely significant effects have been identified due to the potential for coastal squeeze, and the HRA should proceed to stage 3 (Appropriate Assessment).

If no coastal squeeze impacts were identified in the SMP HRA then, subject to a brief review to ensure that the conclusions remain valid, no further action is required with

respect to coastal squeeze. As noted under Option 1, the HRA may still need to proceed to stage 3 for other reasons identified at stage 2.

Option 4 - Proposed works could lead to coastal squeeze, and are in a 'no active intervention' or 'managed realignment' policy unit

If the answers to Screening Step 1 (questions 1 - 4) are all 'yes' (i.e., there is the potential for coastal squeeze to occur) and are in 'no active intervention' or 'managed realignment' policy units in the SMP, then coastal squeeze will not have been assessed at the plan level. Furthermore, WG's policy applies to works which are consistent with the SMP policies, i.e., works to structures that are within 'hold the line' policy units, and therefore would not apply here.

The SMPs often provide further detail on specific management intent for individual policy units which complements the headline policy. For example, in a long policy unit identified as 'No active intervention' the description of the policy intent may state that there are short sections within the policy unit which are currently defended where ongoing investment could be made. Therefore, projects to invest in defences in those locations may still be in line with SMP policy, but the HRA of the SMP won't have considered the impacts of such works, because coastal squeeze impacts were only assessed in 'Hold the line' Policy units

In the first instance, it is recommended that the applicant considers whether a change of SMP policy is required. This should be considered in discussion with the relevant Coastal Group. If the policy is changed to 'hold the line' then option 2 or 3 set out above would apply.

The applicant should also refer to the Welsh National Marine Plan policies SOC_08 and SOC_09 and paragraphs 121 to 125, which explain how regulators should consider compliance with SMP policies when taking decisions.

If the SMP policy remains unchanged, then coastal squeeze may occur, a conclusion of likely significant effect should be recorded at this stage, and the HRA should proceed to stage 3 (Appropriate Assessment).

2.3 Stage 3 – Appropriate Assessment

Carry out an appropriate assessment of the implications of the project in view of the site's conservation objectives, consult the relevant nature conservation body, and where necessary the public.

If proceeding to stage 3, it has already been determined that there is potential for coastal squeeze impacts to occur, leading to a conclusion at stage 2 that likely significant effects cannot be ruled out.

At Stage 3, more detailed consideration is needed of the potential scale, location and timing of those effects in relation to the site's features and conservation objectives. This is used to determine if the effect would be an adverse effect on the integrity of the protected site.

In the case of coastal squeeze, the primary impact would be on the extent of the features present. Conservation objectives associated with zonation of habitats and their distribution may also be affected and these potential effects should be noted where relevant but are likely to be difficult to quantify. Therefore, the quantified assessment of coastal squeeze impacts should primarily focus on habitat extent.

Section 4 of this Guidance Note provides further advice on how to carry out a coastal squeeze assessment, making use of the information already recorded in the SMP HRAs for ‘hold the line’ policy units. In the case of the Dee and Severn Estuaries, the coastal squeeze assessment information is taken from the respective Flood Risk Management Strategy (see Annex 1).

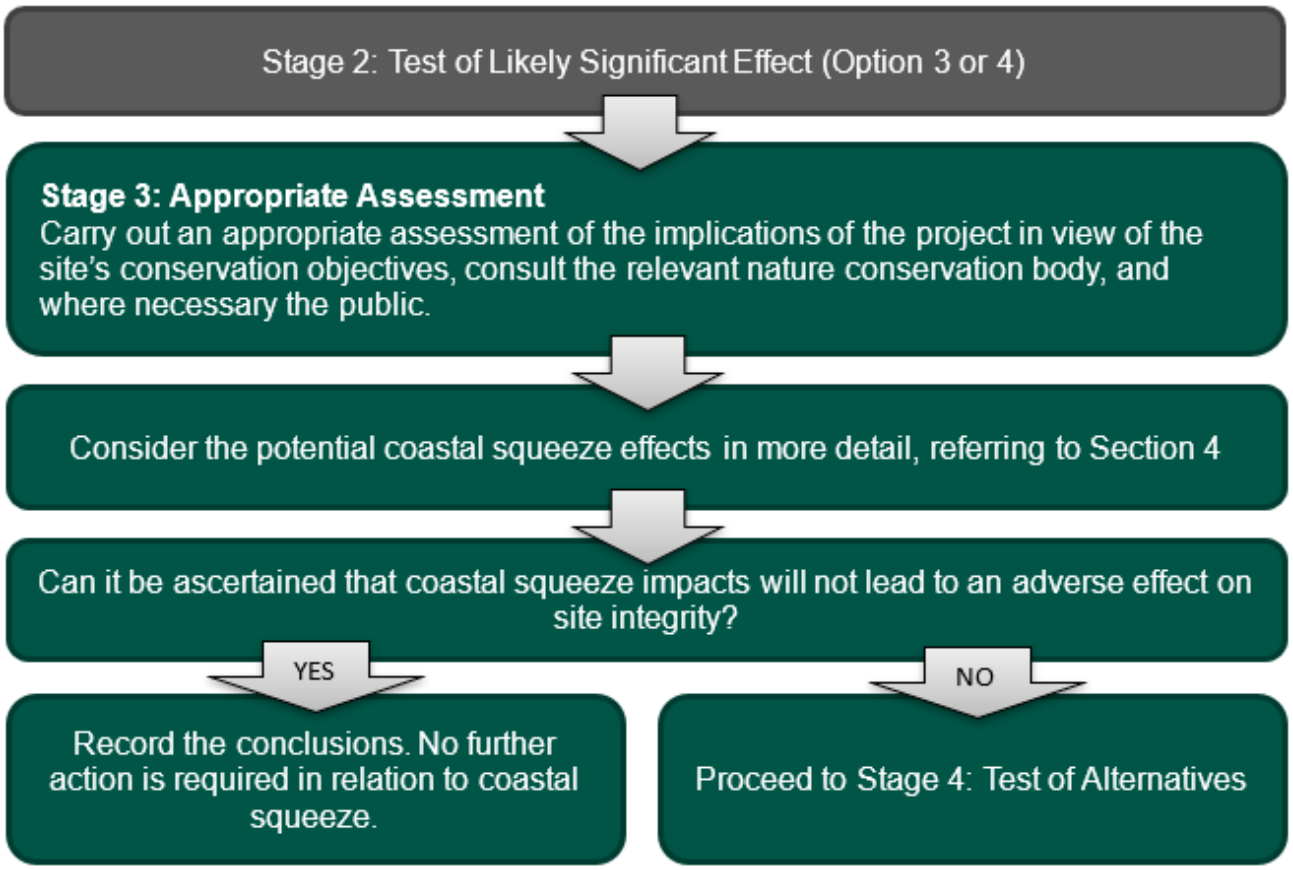
When the results of the coastal squeeze assessment are known, the competent authority, in consultation with the nature conservation body, then considers whether the predicted impacts would lead to a conclusion of adverse effects on site integrity. Any other impacts from the proposed project would also require consideration in reaching this conclusion.

If it can be ascertained that the project will not have an adverse effect on site integrity, then the project may be approved by the competent authority.

If it is concluded that the project may lead to an adverse effect, or if the result is uncertain, then it is possible to consider whether compliance with conditions or other restrictions would enable a conclusion of no adverse effect to be ascertained.

If suitable conditions or restrictions cannot be identified and the conclusion remains that adverse effects on site integrity cannot be ruled out, then a derogation from the Habitats Regulations is required - Stages 4 to 6. This process is illustrated in Figure 5

Figure 5 Flow chart to explain the considerations to be made under Stage 3 (Appropriate Assessment) of the HRA



2.4 Stage 4 – Alternative Solutions

Are there alternative solutions that would have a lesser effect, or avoid an adverse effect on the integrity of the site?

In reaching a conclusion on the preferred policy for a particular policy unit and epoch, SMPs considered the implication of alternative options informed by two assessment scenarios: 'no active intervention' and 'with present management'. The preferred policies were also subject to strategic environmental assessment to help determine the most appropriate policies for each unit and epoch. Therefore, the plan development process included consideration of alternative solutions at the policy (strategic) level. However, the plans did not consider alternative means of delivering the preferred policies e.g., *how* to implement hold the line, detailed design etc, and this was deferred to the project level.

There are two approaches to the test of alternative solutions depending on whether or not the proposed project is within a 'hold the line' policy unit. See options 1 and 2, and Figure 6 below.

Option 1 – the proposed project is within a ‘hold the line’ policy unit

If the proposed project is within a ‘hold the line’ policy unit, then the SMP can be used to support the consideration of alternative solutions in terms of policy. For example, it can show that alternative policies had been considered and tested, and that a conclusion had been reached that the ‘hold the line’ policy was preferred and could be justified.

This means more detailed consideration of alternative solutions at the project level can focus on whether there are alternative ways to deliver the ‘hold the line’ policy which would have a lesser effect or avoid adverse effect on site integrity. For example, consideration could be given to localised set back of the defence structure which would reduce the squeeze effect by creating space. If such measures are not possible whilst still delivering the project objectives, then it can be concluded that there are no alternative solutions.

Option 2 – the proposed project is within a ‘no active intervention’ or ‘managed realignment’ policy unit

In this instance, it is unlikely the SMP can be used to justify there are no alternative solutions at the policy level. This is because the SMP concluded that a policy of ‘hold the line’ was not preferred, and therefore does not support the proposed project to undertake works to a coastal structure.

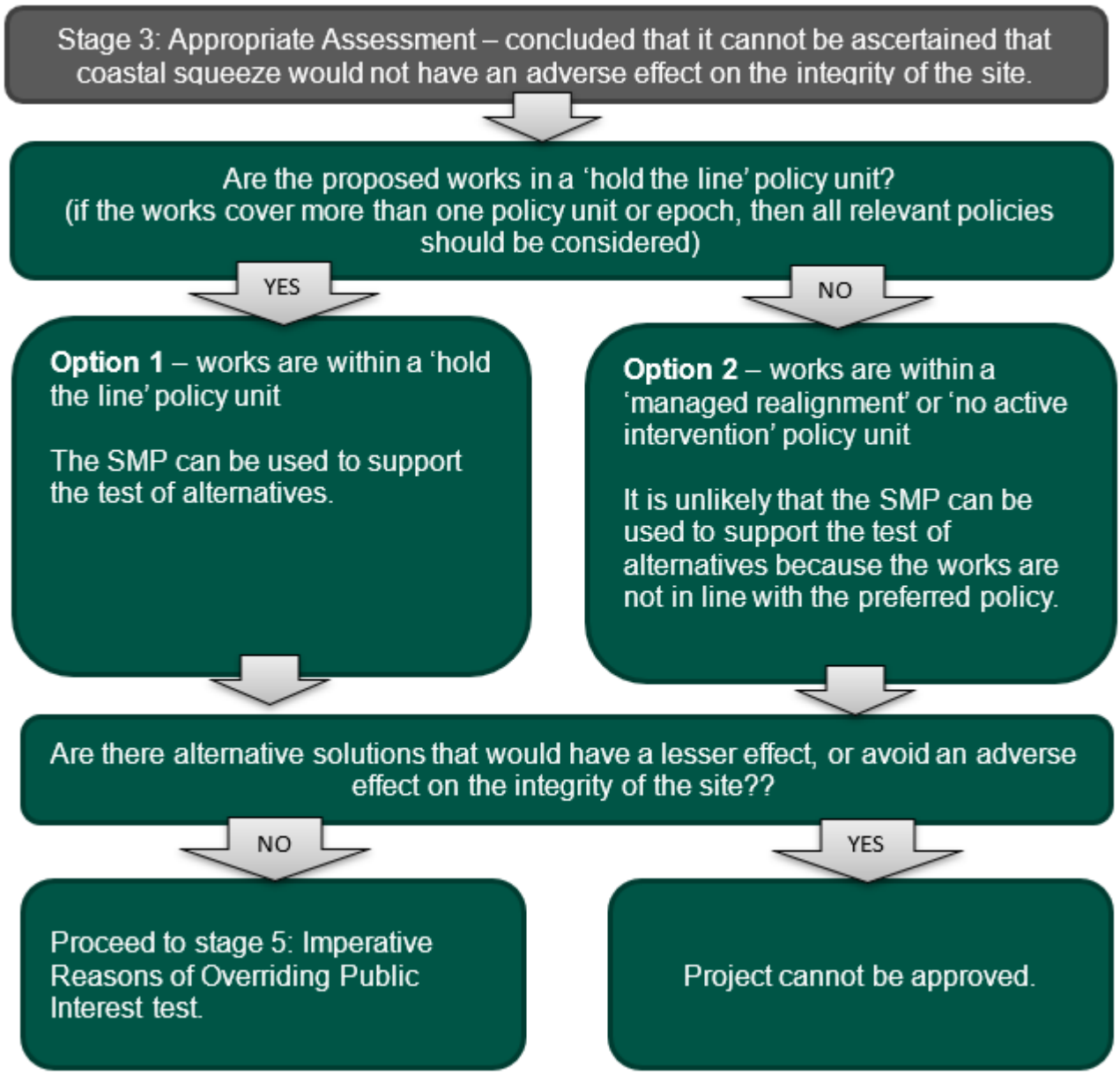
There may, however, be instances where the detail of the policy intent indicates that whilst the majority of a policy unit is ‘no active intervention’, coastal defence works in small discrete sections would not be precluded. It is therefore recommended that SMP policy intent and any relevant supporting information is reviewed to understand any additional detail which may support the test of alternatives.

In most cases, where works are proposed in a policy unit which is not ‘hold the line’, it is expected that significant effort will be required to justify a conclusion different to the one reached in the SMP, that there are no alternative solutions at the policy level. As with option 1, alternative solutions at the project level in terms of detailed design should also be considered.

If alternative solutions are available, the project should not be approved.

If there are no alternative solutions available, then the HRA proceeds to stage 5. This process is illustrated in Figure 6

Figure 6 Flow chart to explain the considerations to be made under Stage 4 (Test of Alternatives) of the HRA



2.5 Stage 5 - Imperative Reasons of Overriding Public Interest (IROPI)

Are there imperative reasons of overriding public interest of a social or economic nature sufficient to override the harm to the site?

Note: if a priority habitat or species is affected, then the reasons of overriding public interest must relate to human health, public safety, or benefits of primary importance to the environment.

In the event that no alternative solutions are feasible, a project may still go ahead if it can be demonstrated there are imperative reasons of overriding public interest. ‘Overriding public interest’ means that the public interest of carrying out the purpose of the project is considered to override the importance of maintaining the site features at that location.

If imperative reasons of overriding public interest can be demonstrated, and the competent authority is minded to approve the project, then they should inform Welsh Ministers and wait 21 days.

The project may be approved subject to Welsh Ministers securing that any necessary compensatory measures are taken to ensure the overall coherence of the National Site Network.

The SMP process included an economic assessment and a strategic environmental assessment which together considered whether there was sufficient social and/or economic justification for the ‘hold the line’ policies being proposed. ‘Hold the line’ policies were not put forward in locations where these justifications could not be made. Therefore, the SMP development process provided evidence to support the Imperative Reasons of Overriding Public Interest (IROPI) test in ‘hold the line’ policy units only. Figure 7 illustrates this process.

Option 1 – the proposed project is within a ‘hold the line’ policy unit

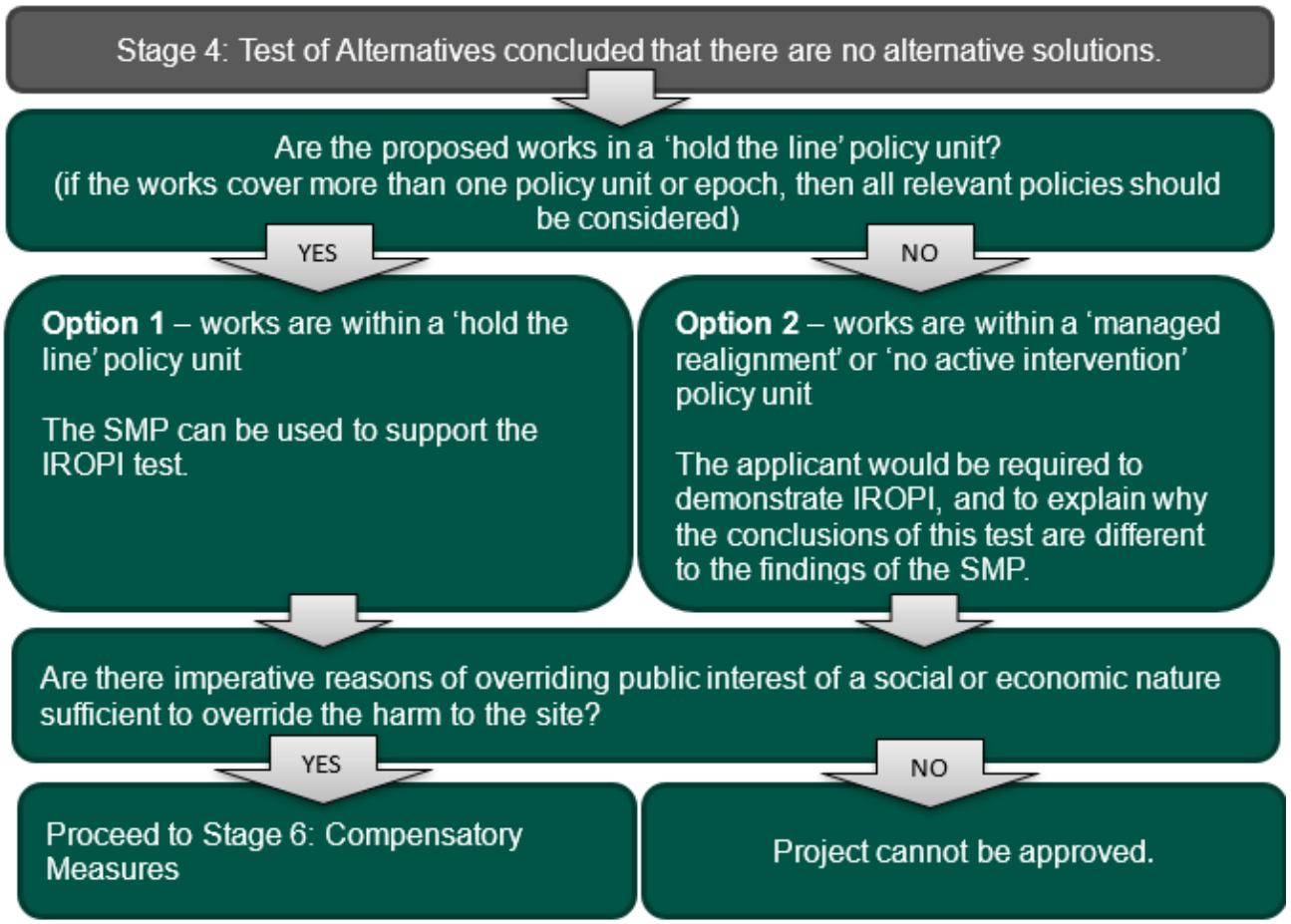
The SMP can be used to support this stage.

WG Policy clarification note paragraph 3.4 states: ‘Provided that an individual project/plan is demonstrably consistent with the relevant Shoreline Management Plan policy, the statutory notice to WG from NRW shall include a short confirmation of the fact and therefore the plan/project is justified on grounds of no alternative solutions and the existing Shoreline Management Plan IROPI.’

Option 2 – the proposed project is within a ‘no active intervention’ or ‘managed realignment’ policy unit

The applicant would be required to provide sufficient information to demonstrate imperative reasons of overriding public interest, and to explain why the conclusions of this test are different to the findings of the SMP.

Figure 7 Flow chart to explain the considerations to be made under Stage 5 (Imperative Reasons of Overriding Public Interest Test) of the HRA



2.6 Stage 6: Compensatory Measures

The project may be approved subject to Welsh Ministers securing that any necessary compensatory measures are taken to ensure the overall coherence of the National Site Network.

WG have directed NRW to deliver compensatory measures for Flood and Coastal Erosion Risk Management projects through the National Habitat Creation Programme (NHCP). The role of NHCP is set out WG's 2021 Policy Clarification Note: Use of the National Habitat Creation Programme in delivering Flood and Coastal Erosion Risk Management projects and applies to Risk Management Authorities (Local Authorities and NRW) in Wales. NHCP should provide compensation for both coastal squeeze and footprint losses associated with projects. This process is illustrated in Figure 8.

The NHCP does not provide compensatory measures in relation to works to third party coastal assets, although it may be possible for a third party to work with the NHCP by exception. Exception criteria are listed in Annex 2. It may therefore be appropriate for third parties to consider development of their own independent strategic programme if they are likely to have larger scale requirements for compensatory measures associated with their

anticipated coastal plans and projects. Compensatory measures would need to be secured to enable Welsh Ministers to approve projects.

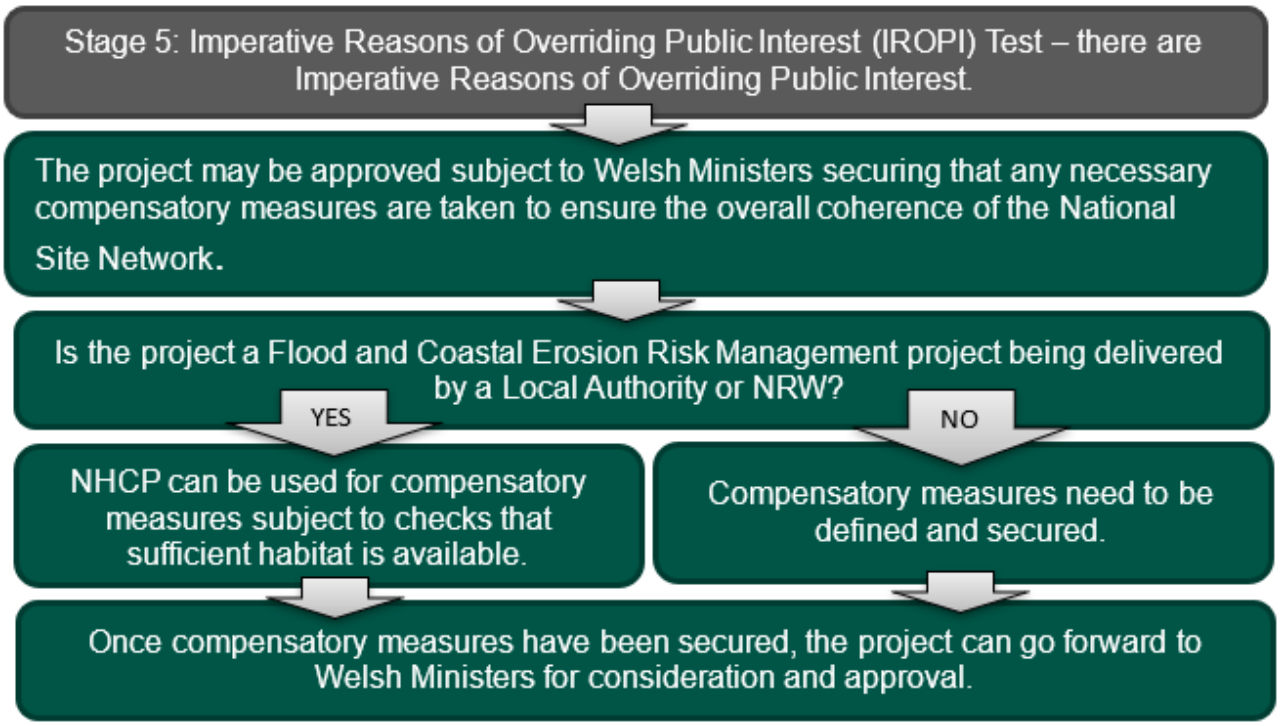
Under the NHCP, opportunities for habitat creation are assessed across Wales and schemes are being developed to provide timely offset of an appropriate scale to maintain the integrity of the National Site Network. In the longer-term, the scale of habitat creation will depend on the rate of sea level rise and the degree of habitat loss identified from the HRAs of plans and projects combined with evidence from monitoring of habitat loss, related to coastal squeeze.

The NHCP is a strategic compensatory delivery mechanism, which is intended to provide a streamlined and integrated approach to habitat creation, with better environmental outcomes than small-scale piecemeal delivery. It should reduce the burden of finding solutions to compensatory habitat requirements on a project-by-project basis and will enable habitat to be delivered in a phased way in response to sea-level rise rather than in advance of each individual project.

Use of NHCP for compensatory measures:

In order for a project to rely on the NHCP for compensatory measures, the Risk Management Authority should clarify the anticipated losses due to coastal squeeze (see section 2.3 and section 4) and ensure that the NHCP has sufficient habitat available to compensate for these losses. It should be noted that habitat creation projects can take several years to deliver and then develop into functioning habitat. Therefore, early notification of likely requirements to NHCP will help to ensure that sufficient habitat is available to enable projects to be approved, assuming all other tests are met.

Figure 8 Flow chart to explain the considerations to be made under Stage 6 (Compensatory Measures) of the HRA



3. Regulation and Permitting

Works to coastal structures may require a range of potential permits or licences, and these will need to be determined on a project specific basis. Early engagement with NRW is therefore encouraged to establish exactly what permits and environmental assessments are required and what they need to cover. It is likely, for example, that a WFD compliance assessment will be required in addition to the HRA.

Due consideration should also be given to other licences/permits and consents that may be required. It is the responsibility of the applicant to satisfy themselves they have obtained all relevant consents and authorisations. In addition, sufficient time should be allowed to work through the consenting process including Habitats Regulations derogation (IROPI) approval if required (see section 2, stage 5).

Note that compliance with plans and policies such as SMP policies and Welsh National Marine Plan Policies (see section 2.2, option 4) is a relevant consideration in the determination of consents.

Information on NRW permits and permissions can be found on NRW's website.

In relation to works to coastal structures, one or several of the following may be required:

- Marine Licence
- Planning Permission (Town and Country Planning)
- Flood Risk Activity Permit

- SSSI consent or assent
- Coast Protection Act Consent

4. Technical Assessment of Coastal Squeeze

This section provides further advice on how to carry out a coastal squeeze assessment, making use of the information already recorded in the SMP HRAs for 'hold the line' policy units. We advise the following key points to help inform the approach to the assessment:

- The coastal squeeze assessment should relate to the lifetime (residual life) of the proposed scheme and assets. It is likely in most instances that the residual life will extend beyond the lifetime of the SMPs (2105) and, depending on the scale of the predicted loss, figures can either be recalculated (see further advice below), extrapolated or the uncertainty/underestimate noted.

- An appropriate area of interest (section of coast or estuary) should be selected depending on the scale of the proposed scheme, its location, and the associated complexity in terms of coastal processes. For example, a large project in a complex estuary is likely to require consideration of a larger area of interest than a small project in a sheltered embayment. SMP policy units can provide a useful subdivision of the coast and may be an appropriate way to define the area of interest. Sometimes multiple policy units may need to be considered.

- The SMP HRA should be consulted first for schemes in 'hold the line' policy units to see if coastal squeeze was predicted at the plan level (see section 5 and Annex 1).

- If so, and the predicted coastal squeeze is very small for the relevant policy unit and lifetime of the scheme (e.g., less than 1 Ha), there may be limited benefit in carrying out a more detailed assessment, and the SMP figures could be used within Stage 3 (Appropriate Assessment) of the HRA.

- If the predicted coastal squeeze losses are large (e.g., more than 1 Ha) then additional assessment, referring to the What is Coastal Squeeze? Report should be considered, and would provide the opportunity to apply the updated sea-level rise guidance from WG: Flood and coastal erosion risk management: adapting to climate change | GOV.WALES. This would also provide the opportunity to calculate losses up to the end of the residual life of the structure if this is beyond 2105 (the end of the third SMP epoch).

- The Flood Map for Planning shows the 1 in 1000 year flood extent with 100 years of predicted sea-level rise included and is therefore a useful indicator of future flooding risk. These will help to determine the extent of potential accommodation space for habitats to roll back, i.e., what would happen if the works to the coastal structure weren't undertaken, and the structure was allowed to degrade. In some instances, the available accommodation space will be less than the predicted losses due to coastal squeeze, and this needs to be considered within the assessment.

- The assessment must describe the effects in relation to Annex 1 coastal/intertidal features of designated sites within the National Site Network.

- A range of estimates should be provided which consider best to worst case scenarios, and a confidence assessment should also be assigned.

NRW recommends that anyone who needs to undertake a more detailed coastal squeeze assessment refers to the What is Coastal Squeeze? Report, which is discussed in more detail below. Of particular relevance are:

- Section 5 – which provides the definition of coastal squeeze (as set out in section 1 of this Guidance Note)
- Section 6 – Method for calculating coastal squeeze, especially section 6.3 which relates to predicting future effects.

The What is Coastal Squeeze? Report Section 6.3.4 (Predict future habitat losses) describes a range of potential tools/predictive models to inform the assessment of the potential scale of coastal squeeze. The tools which can be applied will vary in cost, complexity, and data requirements. The final step of the assessment (Section 6.3.6 Evaluation of causes of loss and the role of coastal squeeze) requires expert judgement to assess whether the observed/predicted changes represent coastal squeeze. Expert judgement is needed since there are multiple causes of changes in coastal habitat, and the physical expression of these changes can be similar. The method outlines how an assessment of confidence in the findings - 'high', 'medium' or 'low' - should be made. Where there is low confidence, two approaches can be taken:

- Adopt the precautionary principle, assume that habitat losses result from coastal squeeze, and review the assessment in the future.
- Carry out further studies to increase confidence in the findings.

At each step, the report explains what needs to be considered, potential sources of data, and sources of uncertainty in the assessment.

5. Supporting Information

5.1 Shoreline Management Plans

NRW's website contains information about Shoreline Management Plans, and the plan documents can be found on the relevant Coastal Group websites as follows:

- Severn Estuary
- South Wales (Lavernock Point to St Ann's Head)
- West of Wales (St Ann's Head to Great Orme)
- North Wales and North West England

Annex 1 provides a summary table of Hold the Line Policy Units across all four SMPs where coastal squeeze was identified within the respective SMP HRA.

5.2 Maps and Data

- Information on flooding and coastal erosion risk can be found here Flood Map for Planning (naturalresources.wales) along with maps of Shoreline Management Plan Policy
- Information on designated sites can be found here: Natural Resources Wales / Protected areas of land and seas
- Various datasets including designated site and feature information, Shoreline Management Plan Policy layers, and LiDAR data can be downloaded from the Lle geoportal Lle - Home (gov.wales), which is in the process of being replaced by DataMapWales Home | DataMapWales (gov.wales).
- Coastal monitoring data is available from the Wales Coastal Monitoring Centre | WCMC
- Refer to the What is Coastal Squeeze? Report for other recommended sources of data.

Annex 1: Summary tables of Shoreline Management Plan ‘hold the line’ policy units where coastal squeeze was identified as a potential impact within the HRA

Predicted coastal squeeze losses associated with ‘hold the line’ policy units in SMPs are set out below for the four plans which cover the Welsh coast. The approach to the assessment for each SMP is described in each case.

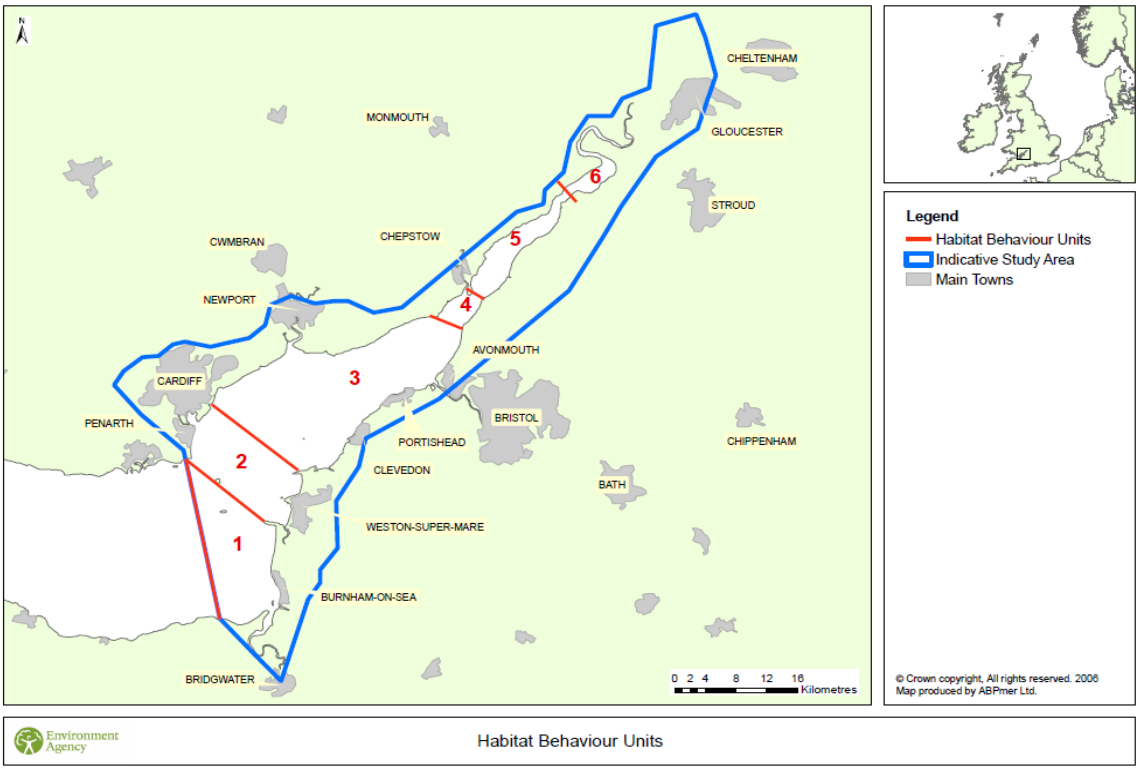
1. Severn Estuary Shoreline Management Plan

The information presented below is drawn from work originally undertaken for the Severn Estuary Coastal Habitat Management Plan (CHaMP), which informed the SMP HRA, and was subsequently refined to inform the Severn Estuary Flood Risk Management Strategy HRA.

The work involved an extensive literature review and development of a conceptual understanding of the estuary processes and its morphological evolution as well as a comprehensive habitat inventory. The use of various morphological assessment tools and analytical techniques were applied to determine future morphological behaviour over timescales of 20, 50 and 100 years. This resulted in a habitat gain/loss account.

The predicted habitat losses were estimated for six Habitat Behaviour Units shown in the map (Figure 9) below.

Figure 9 Map of Severn Estuary Habitat Behaviour Units (taken from the Severn Estuary CHaMP)



Initially, within the Severn Estuary CHaMP, extensive losses were predicted, and these were included in the SMP HRA/IROPI case. However, on further refinement (via work on the Flood Risk Management Strategy), it was agreed that only some of the predicted intertidal losses are likely to be caused by flood and coastal erosion management structures/activities.

These refined results are summarised for each Habitat Behavioural Unit in Table 1, with negative figures indicating a habitat loss:

Table 1: Predicted Habitat Losses for Habitat Behaviour Units in the Severn Estuary, taken from the Severn Estuary Flood Risk Management Strategy

Habitat Behaviour Unit	Short term (Ha)	Medium term (Ha)	Long term (Ha)	Total (Ha)
1	63	-66	-253	-256
2	1	-14	-40	-53
3	-440	-797	-1126	-2363
4	-4	-9	-156	-169
5	-136	-19	-206	-361
6	29	90	201	320
Total (Ha)	**-497**	**-815**	**-1580**	**-2892**

NRW has undertaken further work to apportion the predicted losses according to asset length within each policy unit. Table 2 below sets out the split between England and Wales for each Habitat Behaviour Unit. Table 3 then set out the figures for each policy unit.

Table 2 Predicted habitat loss split between England and Wales for each Habitat Behaviour Unit

Habitat Behaviour Unit	Wales Epoch 1 (Ha)	England Epoch 1 (Ha)	Wales Epoch 2 (Ha)	England Epoch 2 (Ha)	Wales Epoch 3 (Ha)	England Epoch 3 (Ha)
1	0	63	0	-66	0	-253
2	0.1	0.9	-1.2	-12.8	-3.5	-36.5
3	-236	-204	-427	-370	-604	-522
4	-1.5	-2.5	-3.3	-5.7	-57	-99

Table 3 Predicted habitat loss estimates for each policy unit relevant to Wales

Habitat Behaviour Unit	Policy Unit	Total asset length with PU (m)	Coastal Squeeze Epoch 1 (ha)	Coastal Squeeze Epoch 2 (ha)	Coastal Squeeze Epoch 3 (ha)
2	PEN2	436.8m	0.03	-0.4	-1.0
2	CAR1	1035.5m	0.06	-0.9	-2.5
3	CAR2	620.0	-4.4	-7.9	-11.2
3	CAR3	592.1	-6.7	-12.2	-17.2
3	WEN1	2695.4	-19.1	-34.5	-48.8
3	WEN2	9627.3	-68.0	-123.3	-174.1
3	CALD1	19481.6	-137.7	-249.4	-352.4
4	CALD3	4864.0	-1.5	-3.3	-57.4

2. South Wales Shoreline Management Plan (Lavernock Point to St Ann's Head)

For the South Wales SMP, four assessments of potential coastal squeeze habitat loss were undertaken using the following sea-level rise scenarios: UKCP09 Low, UKCP09 Central, UKCP09 High, and Defra 2006. Table 4 shows the lowest estimate (derived from UKCP09 Low in all cases) and highest estimate (derived from either UKCP09 high or Defra 2006) for each epoch. Habitat type affected was not recorded alongside the figures presented.

Table 4 Table 4 Predicted habitat loss figures for the South Wales SMP, showing the lowest estimate (derived from UKCP09 Low in all cases) and highest estimate (derived from either UKCP09 high or Defra 2006) for each epoch.

Policy Unit	Habitat Loss (Ha) Epoch 1	Habitat Loss (Ha) Epoch 2	Habitat Loss (Ha) Epoch 3	Designated Site
12.1	1.3 – 5.0	3.6 - 13.4	8.5 – 37.5	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
12.2	8.9 – 18.2	24.6 – 50.5	57.6 – 118.0	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
12.6	7.0 – 8.0	18.4 – 22.5	52.5 – 52.5	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
12.7	0.3 – 1.1	0.8 – 2.8	1.8 – 8.0	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
12.8	3.1 – 11.9	8.7 – 32.1	20.3 – 90.0	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
12.10	2.9 – 3.8	8.1 – 10.7	19.0 – 25.0	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar

Policy Unit	Habitat Loss (Ha) Epoch 1	Habitat Loss (Ha) Epoch 2	Habitat Loss (Ha) Epoch 3	Designated Site
14.2	5.2 – 19.9	14.5 – 53.6	33.9 – 150.0	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
14.3	3.5 – 13.3	9.7 – 35.7	22.6 – 100.0	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
14.9	1.3 – 5.0	3.6 – 13.4	8.5 – 37.5	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
14.19	0.8 – 3.1	2.2 – 8.3	5.2 – 23.2	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
16.4	0.0 - 0.0	0.0 – 0.0	0.0 – 0.1	Carmarthen Bay and Estuaries SAC; Burry Inlet SPA; Burry Inlet Ramsar
20.6	0.0 - 0.0	0.0 – 0.0	0.0 – 0.1	Pembrokeshire Marine SAC
21.2	0.2 – 0.7	0.5 – 1.7	1.1 – 5.0	Pembrokeshire Marine SAC
21.3	0.2 – 0.6	0.4 – 1.6	1.0 – 4.4	Pembrokeshire Marine SAC

3. West of Wales Shoreline Management Plan (St Ann's Head to Great Orme)

In Table 5 below, estimates of coastal squeeze habitat losses are provided, including an indication of habitat type affected. Cells containing "Null" indicate a change in policy from 'hold the line' to 'managed realignment', or 'no active intervention'.

Table 5 Predicted habitat loss figures for the West of Wales SMP. Cells containing "Null" indicate a change in policy from 'hold the line' to 'managed realignment', or 'no active intervention'

Policy Unit	Habitat Loss (Ha) Epoch 1	Habitat Loss (Ha) Epoch 2	Habitat Loss (Ha) Epoch 3	Habitat Type	Designated Site
2.2	0.23	0.02	Null	Mudflats and Sandflats	Pembrokeshire Marine SAC
2.4	0.01	0.60	Null	Mudflats and Sandflats	Pembrokeshire Marine SAC
2.5	0.12	Null	Null	Mudflats and Sandflats	Pembrokeshire Marine SAC
2.6	0.08	0.37	Null	Mudflats and Sandflats	Pembrokeshire Marine SAC
2.8	0.32	Null	Null	Mudflats and Sandflats	Pembrokeshire Marine SAC
3.2	0.17	0.03	Null	Mudflats and Sandflats	Pembrokeshire Marine SAC
3.3	0.08	0.38	0.08	Mudflats and Sandflats	Pembrokeshire Marine SAC
3.4	0.01	Null	Null	Mudflats and Sandflats	Pembrokeshire Marine SAC
3.5	0.01	0.04	0.03	Mudflats and Sandflats	Pembrokeshire Marine SAC
3.8	0.02	Null	Null	Mudflats and Sandflats	Pembrokeshire Marine SAC

Policy Unit	Habitat Loss (Ha) Epoch 1	Habitat Loss (Ha) Epoch 2	Habitat Loss (Ha) Epoch 3	Habitat Type	Designated Site
10.3	0.47	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.6	2.30	150.2	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.6	1.84	120.16	Null	Atlantic Saltmeadow	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.7	0.87	13.09	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.8	0.00	0.35	0.00	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.9	1.65	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.11	1.13	8.23	25.27	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.12	0.00	3.19	1.92	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.13	0.00	0.72	0.51	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
10.17	0.29	6.39	1.59	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA

Policy Unit	Habitat Loss (Ha) Epoch 1	Habitat Loss (Ha) Epoch 2	Habitat Loss (Ha) Epoch 3	Habitat Type	Designated Site
10.18	0.00	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC and Dyfi Estuary SPA
11.1	0.43	6.82	1.46	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
11.3	0.24	0.90	0.11	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
11.4	0.15	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
11.6	1.16	Null	Null	Atlantic Saltmeadow	Pen Llyn a'r Sarnau SAC
11.7	0.00	2.42	2.51	Atlantic Saltmeadow	Pen Llyn a'r Sarnau SAC
11.8	1.20	7.77	12.93	Atlantic Saltmeadow	Pen Llyn a'r Sarnau SAC
11.9	1.90	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
11.11	0.00	0.00	0.02	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.2	0.00	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.3	0.00	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.4	0.00	4.38	2.93	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.6	0.00	2.11	1.83	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC

Policy Unit	Habitat Loss (Ha) Epoch 1	Habitat Loss (Ha) Epoch 2	Habitat Loss (Ha) Epoch 3	Habitat Type	Designated Site
12.8	0.03	2.82	3.71	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.8	0.03	2.54	3.34	Atlantic Saltmeadow	Pen Llyn a'r Sarnau SAC
12.9	0.20	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.9	0.18	Null	Null	Atlantic Saltmeadow	Pen Llyn a'r Sarnau SAC
12.13	0.00	6.01	18.00	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.13	0.00	3.00	9.00	Atlantic Saltmeadow	Pen Llyn a'r Sarnau SAC
12.14	0.00	0.30	1.56	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.14	0.00	0.01	0.08	Atlantic Saltmeadow	Pen Llyn a'r Sarnau SAC
12.17	0.00	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.18	0.00	0.30	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.20	0.00	0.82	0.12	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
12.24	0.00	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
13.6	0.00	1.19	0.80	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC

Policy Unit	Habitat Loss (Ha) Epoch 1	Habitat Loss (Ha) Epoch 2	Habitat Loss (Ha) Epoch 3	Habitat Type	Designated Site
13.7	0.00	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
13.8	0.00	Null	Null	Mudflats and Sandflats	Pen Llyn a'r Sarnau SAC
16.5	0.65	Null	Null	Mudflats and Sandflats	Menai Strait and Conwy Bay SAC
16.9	0.17	3.30	3.65	Mudflats and Sandflats	Anglesey Coast Saltmarsh SAC
16.11	0.53	3.47	Null	Mudflats and Sandflats	Menai Strait and Conwy Bay SAC
16.33	0.03	0.4	Null	Mudflats and Sandflats	Menai Strait and Conwy Bay SAC
20.1	0.00	0.03	0.01	Mudflats **and** Sandflats	Menai Strait **and** Conwy Bay SAC

4. North Wales and North West England Shoreline Management Plan

Policy Unit level calculations of coastal squeeze were not undertaken for the North Wales and North West England SMP, but the HRA was informed by work undertaken concurrently on the Dee Estuary Flood Risk Management Strategy. It concluded that coastal squeeze is not predicted to impact the estuarine features of the Dee Estuary SAC, SPA, or Ramsar in the short-term (0-20 years). However, there is increasing uncertainty that a positive sediment regime will be maintained, so the possibility of potential losses is likely to increase through the second epoch and becomes likely by some point in the third epoch.

The precautionary, 'worst case' prediction for the maximum area of intertidal habitat that could be adversely affected as a result of implementing a 'Hold the line' policy approach to flood defence around the **entire** estuary is 140ha at Year 50, increasing to a total of 594ha at Year 100. However, it should be noted that hold the line is not the preferred policy for the whole estuary within the SMP.

For the Welsh shore of the Dee Estuary, potential adverse effects due to coastal squeeze were noted in Policy Units 5.1, 5.2 and 5.3.

Annex 2: Approach to engaging with the National Habitat Creation Programme for Third Parties

The National Habitat Creation Programme (NHCP) is a WG Programme managed by NRW. The purpose of the NHCP is to provide compensatory measures to address predicted impacts due to coastal squeeze (and footprint losses) associated with Flood and Coastal Erosion Risk Management projects delivered by Risk Management Authorities (Local Authorities and NRW). The NHCP identifies opportunities to deliver compensatory habitat to secure the coherence of the National Site Network. Whilst the NHCP is intended to provide compensatory measures for Risk Management Authorities only, there are a number of exceptions when a third party may benefit from working with and investing in an NHCP project. These are set out below.

Rules for justifying 3rd party engagement with the National Habitat Creation Programme (NHCP)

In January 2019 a series of criteria were agreed with WG that describe the exceptional circumstances which might allow for a third party to work in partnership with the NHCP to deliver compensatory habitat. This would potentially support a third party's ability to demonstrate provision of appropriate compensatory habitat for coastal plans and projects which could be presented within an IROPI Statement of Case.

1. Working with a particular third party is helpful in supporting NHCP strategic objectives.

2. Habitat Compensation banking comprises/and or includes land offered by third party as part of compensation banking terms (otherwise not available to NHCP for managed realignment).

3. Working with a particular third party optimises opportunities for managed realignment that otherwise may not be feasible without the third-party investment and compensation banking, for example due to their asset lying within the area of interest (e.g., Network Rail).

4. Working with a particular third party supports an IROPI case related to a third party with a high level of public interest/scrutiny.

5. Working with a particular third party provides synergy/is complementary to the proposal in supporting other (non- National Site Network related) economic, social or environmental objectives aligned with WG and NRW priorities.

6. Working with a particular third party supports a Marine Licence applicant (and IROPI case) that already has an exceptionally well-defined compensatory proposition.

7. Working with a particular third party supports a Marine Licence (IROPI) applicant that has demonstrated an exceptional level of commitment to making the compensation work/be sustainable in the long term.

8. Working with a particular third party supports a Marine Licence (IROPI) applicant because of the exceptional technical challenges/impossibility of the applicant delivering a large-scale compensation requirement other than through NHCP.

9. Working with a particular third party supports their Marine Licence (IROPI) applicant based on integrity/type (i.e., strategic commitment with financial backing or an opportunist).

10. Working with a particular third party supports a Marine Licence (IROPI) applicant that is willing and able to offer a significant commuted sum for pro-rata banking of compensatory measures (support a business case that may otherwise not be approved due to cost).

11. Working with a particular third party supports a Marine Licence (IROPI) applicant, and the Minister is prepared to agree to the exception.

12. A combination of the above. These represent scenarios the WG would regard as an 'exception'

Notably it is not the purpose of these exception rules to enable a guaranteed approach to long term provision of third-party compensatory needs, but rather an opportunity through invitation by NRW on a project-by-project basis.