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Water and Environment Management Framework
Lot 3 – Engineering and Related Services

West Wight Coastal Flood and Erosion Risk Management Strategy

Appendix I - Water Framework Directive Assessment

November 2016

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Document overview

Capita AECOM was commissioned by the Isle of Wight Council in October 2014 to undertake a Coastal Flood and Erosion Risk Management Strategy. As part of this commission, a Water Framework Directive Assessment is required. This document informs the long-term Strategy through the identification of the potential impacts of the implementation of the Strategy on the current and future condition of water bodies and their objectives under the Water Framework Directive.

Document history

Version	Status	Issue date	Prepared by	Reviewed by	Approved by
1	Draft	September 2015	Penelope Pickerin – Graduate Consultant Gemma Hoad – Senior Water Consultant	Jon Short – Senior Coastal Specialist Carl Pelling - Associate	Carl Pelling - Associate
2	Updates following client review	December 2015	Ben Taylor – Graduate Coastal Engineer	Jonathan Short – Senior Coastal Specialist	Tara-Leigh McVey - Associate
3	Updates for consultation	March 2016	Ben Taylor – Graduate Coastal Engineer	Jonathan Short – Senior Coastal Specialist	Tara-Leigh McVey - Associate
4	Final	November 2016	George Batt - Assistant Coastal Engineer	Ben Taylor – Assistant Coastal Engineer	Jon Short – Principal Coastal Specialist

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Abbreviation	Description
AA	Appropriate Assessment
AWB	Artificial Waterbody
BQE	Biological Quality Elements
CCMA	Coastal Change Management Area
GEP	Good Ecological Potential
GES	Good Ecological Status
GWB	Groundwater Body
HMWB	Heavily Modified Waterbody
HTL	Hold the Line (SMP2 policy)
LNR	Local Nature Reserve
MR	Managed Realignment (SMP2 Policy)
NAI	No Active Intervention (SMP2 Policy)
NNR	National Nature Reserve
ODU	Option Development Unit
PDZ	Policy Development Zones
RBD	River Basin District
RBMP	River Basin Management Plan
SAC	Special Area of Conservation (Habitats Directive)
SNCI	Site of Nature Conservation Importance
SMP2	Shoreline Management Plan
SPA	Special Protection Area (Birds Directive)
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SMZ	Strategy Management Zone
TraC	Transitional and Coastal Waterbody
WFD	Water Framework Directive

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1. Introduction

1.1 Purpose of Report

This report represents an assessment of the West Wight Flood and Coastal Erosion Risk Management Strategy ('The Strategy') against the objectives of the Water Framework Directive[1] (WFD), according to the requirements of the Environment Agency document *'Assessing new modifications for compliance with WFD: detailed supplementary guidance'*[2].

This document provides detailed supplementary guidance on how to assess the impacts of new modifications in the water environment to ensure compliance with the WFD in line with *'Assessing new modifications for compliance with WFD'*[3].

As a part of the Strategy, an assessment of the implications of the WFD Regulations[4] is required. The purpose of the WFD is to establish a framework for protecting the existing condition and enhancing the future condition of inland surface waters, transitional waters, coastal waters and groundwaters. The requirements of the WFD need to be considered at all stages of the coastal planning process, by reference to the River Basin Management Plans (RBMPs)[5] which set out how the objectives of the Directive are to be achieved for each River basin District (RBD) in England and Wales.

West Wight falls entirely within the South East River Basin District which was published in December 2009 and due for revision in late 2015 after undergoing stakeholder consultation. Each RBD has been characterised into smaller management units known as 'Water Bodies', each of which will be identified and assessed within this report.

> This report will be subject to public consultation and formal review by the Environment Agency, Natural England and the Isle of Wight Council.

1.2 Context and Background

The Isle of Wight Council is developing a Coastal Flood and Erosion Risk Management Strategy for 'West Wight' in conjunction with AECOM/Capita and the Environment Agency, which extends from Freshwater Bay to East Cowes.

This project frontage comprises the Policy Development Zones (PDZs) 6, 7 and 1 (running clockwise from west to east) as outlined in the 2010 Shoreline Management Plan (SMP) 2 for the Isle of Wight[6]. PDZs 6, 7, and 1 are shown below in Figure 1-1.

[1] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

[2] Assessing new modifications for compliance with WFD: Detailed Supplementary Guidance, Environment Agency, 2010

[3] Assessing new modifications for compliance with WFD, Environment Agency, 2010

[4] http://www.legislation.gov.uk/uksi/2003/3242/contents/made

[5] https://www.gov.uk/government/collections/river-basin-management-plans

[6] Isle of Wight Shoreline Management Plan (2010) http://www.coastalwight.gov.uk/smp/

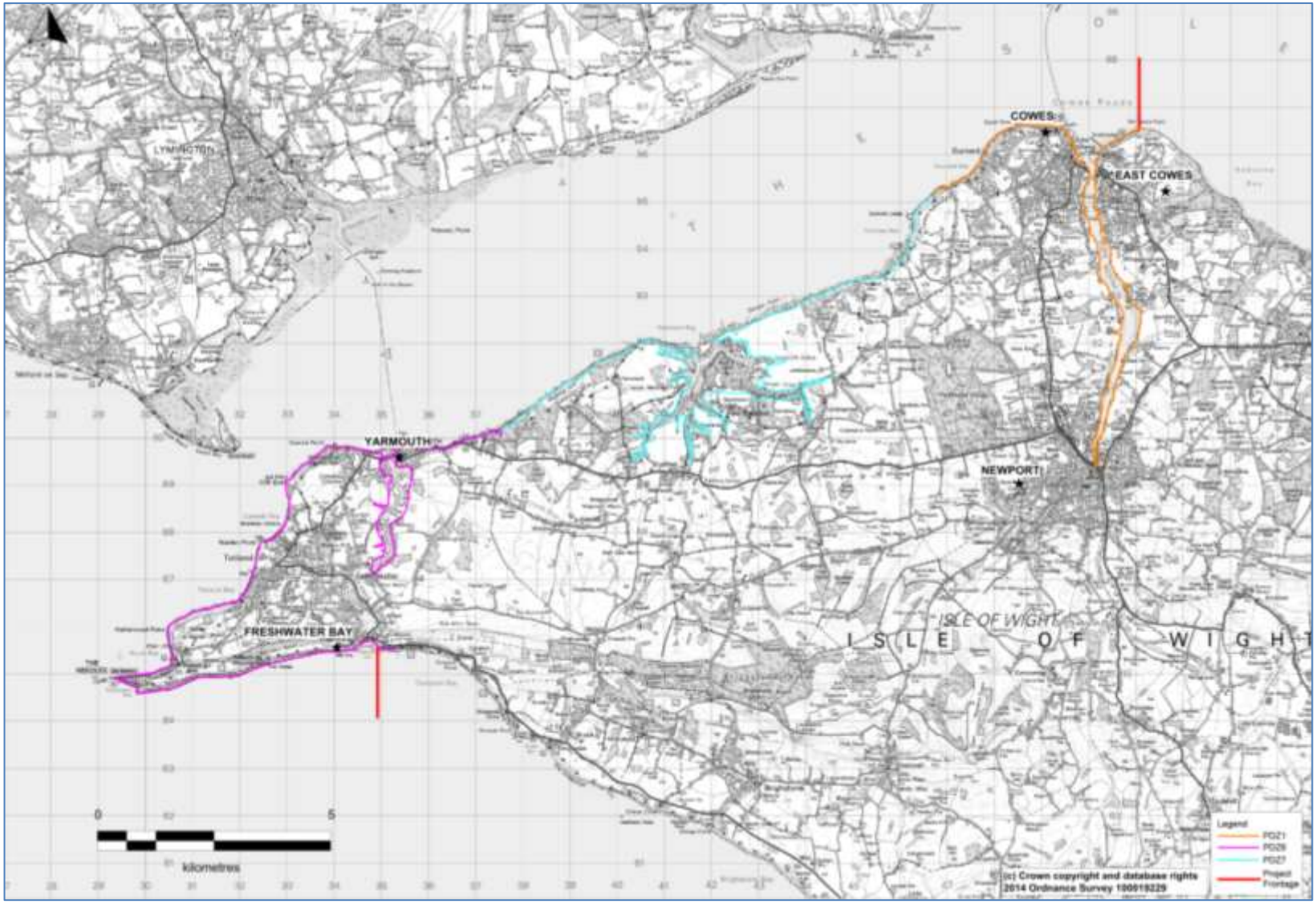


Figure 1-1: Isle of Wight SMP Policy Development Zones which the Strategy covers

The geographical extent of the PDZs is set out as follows:

PDZ 6: West Wight (from the eastern margin of Freshwater Bay around the West Wight headland to include Yarmouth (to the eastern margin of Port la Salle);

PDZ 7: North-west Coastline (from the eastern margin of Bouldnor to the western margin of Gurnard Luck); and,

PDZ 1: Cowes and the Medina Estuary (from Gurnard Luck to Old Castle Point (East Cowes).

A Policy Development Zone is defined as a length of coastline with a particular character defined in the SMP for the purpose of assessing all issues and interactions to develop management scenarios. These zones are only used in the procedure of developing policy. Policy Units and Management Areas are then used for the final definition of the policies and the management of the coast in the SMP.

1.2.1 The Strategy

The purpose of developing a Coastal Flood and Erosion Risk Management Strategy (herein the 'Strategy') is to take the work one stage further than the SMP and to outline the measures and actions which shall be undertaken to protect and enhance the coastline and its assets in both the short (10 year), medium (10-40 years) and long term (40 – 100 years).

A coastal strategy provides an assessment of the risks associated with coastal processes and presents preferred strategic options to reduce these risks to people and the developed, historic and natural environment in a sustainable manner. In doing so, The Strategy forms an important element of the policy for flood and coastal defence and also provides guidance for spatial planning within the coastal zone. It is intended that this Strategy is acceptable to the communities living and working in the coastal zone.

1.2.2 Isle of Wight Shoreline Management Plan 2 (2010)

The West Wight Strategy builds on the work undertaken in developing the Isle of Wight Shoreline Management Plan 2 in 2010. The SMP2 document, developed by the Isle of Wight Council and supporting Client Steering Group (CSG), sets out the results of the first revision to the original SMP for the area of coast extending around the Isle of Wight.

As previously described, the project frontage for the West Wight Strategy encompasses the lengths of PDZs 6, 7 and 1 of the Isle of Wight SMP 2.

The Strategy retains the use of Policy Units as defined by the SMP (named Option Development Units or ODUs in the Strategy), and developed Strategy Management Zones (SMZs) in replacement of the PDZs originally developed by the SMP 2. The Strategy development process is outlined in further detail in Section 4.

The three PDZs from the SMP which cover the West Wight area encompass six SMZs defined within the West Wight Strategy as follows:

- PDZ 6 → SMZs 1, 2 and 3
- PDZ 7 → SMZ 4
- PDZ 1 → SMZ 5 and 6

The SMZ locations and Strategy Option Development Units (ODUs) are shown in Figure 1-2.

1.3 Strategy Objectives

The aim of the West Wight Coastal Flood and Erosion Risk Management Strategy is to reduce risks to people, the developed and natural environment from flooding and coastal erosion

through the development and implementation of a sustainable technically feasible, economically viable and environmentally sustainable management options.

A number of primary and secondary objectives were developed at the outset of the project. These primary and secondary objectives support the delivery of the overarching aim of the Strategy. These objectives were incorporated within the Strategy development process and were key considerations in the appraisal of potential management options. The objectives of the West Wight CFERMS are shown below:

The primary Strategy objectives are:

- To build on the work of the Isle of Wight Shoreline Management Plan 2 (2010) by identifying the consequences of implementing the preferred policies, and seeking the most appropriate and achievable methods to do so.
- To determine the optimum economic level of coastal flood and erosion protection for the West Wight through assessment of options.
- To provide a co-ordinated approach between the authorities and organisations managing the coastline.
- To balance the needs of people and the environment in a dynamic coastal environment with flood, erosion and landslide risks.
- To consult with the community to seek acceptable and achievable methods to implement the IW SMP2 Policies.
- To provide an affordable and deliverable Strategy agreed by stakeholders and funding partners.
- To identify any required Schemes, including their location, timing, feasibility, costs, benefits, Partnership Funding scores and Outcome Measures.
- To define and prioritise an implementation plan of technically, economically and environmentally sustainable proposals for managing coastal flood and erosion risks over the 100 year appraisal period.

The secondary Strategy objectives are:

- To refine the understanding of coastal flooding and erosion risks using the latest information.
- To assess the standard of protection provided by the existing coastal infrastructure.
- To identify existing environmental and socio-economic constraints that will have a bearing on the outcome of the Coastal Strategy.
- To utilise existing information for the area where possible.
- To understand and consider multiple natural risks.
- To seek coordinated solutions in areas of complex ownership.
- To encourage awareness and adaptation.
- To understand the implications and opportunities of the Partnership Funding system for the risk management authorities, decision-makers and individuals, including: enabling access to seek future Flood and Coastal erosion Risk Management Grant in Aid (FCRM-GiA) and identifying funding gaps and potential contributions.
- To assist communities to reduce flood and erosion risks, where appropriate, through contributing information to help them consider their options.
- To consider opportunities for coastal access and broader outcomes linked to initiatives such as regeneration, development, tourism, recreation and amenity.
- The outcome of the Strategy can inform Coastal Change Management Area boundaries and policies, including understanding residual risks, to inform the Local Planning Authority.
- To comply with all legal requirements.

1.4 Strategy Development - Approach

Flood and erosion risks, coastal defence types, land uses, land ownership and issues and opportunities vary significantly along the Strategy frontage. For effective flood and erosion risk management options to be developed it is important to consider and recognise this local variability.

With this in mind, each SMZ was then divided into sub-areas, known as Option Development Units (ODUs) in order to consider different options. A long list of potential options (measures or actions) was developed for each of the ODUs, which were then individually appraised so that a short list of options for each ODU was developed.

The Option Development Units are shown in Table 1-1 and Figure 1-2.

Table 1-1: Option Development Units

Policy Unit	SMZ	Area	Policy Unit	SMZ	Area
W1	1	Tennyson Down, Alum Bay and Headon Warren	W17	3	Yarmouth Common to Port la Salle
W2	2	Southern Totland Bay	W18	4	Bouldnor Copse and Hamstead
W3		Northern Totland Bay	W19		Newtown Estuary

Policy Unit	SMZ	Area	Policy Unit	SMZ	Area
W4		Southern Colwell Bay	W20		Thorness Bay and southern Gurnard Bay
W5		Central Colwell Bay	W21		Gurnard Luck
W6		Fort Albert	W22	5	Gurnard Cliff
W7		Fort Victoria Country Park	W23		Gurnard to Cowes Parade
W8		Fort Victoria and Norton	W24		Cowes Town Centre to Fountain Yard
W9		Norton Spit	W25		Fountain Yard to Medina Wharf
W10		Western Yar Estuary - Western shore	W26		Kingston Road Power Station to Shrape Breakwater
W11		The Causeway	W27		Shrape Breakwater to Old Castle Point
W12	3	Freshwater Bay	W28	6	Central Medina – north west
W13		Western Yar Estuary - Eastern shore	W29		West Medina Mills
W14		Thorley Brook and Barnfields Stream	W30		Central Medina – south west
W15		Thorley Brook to Yar Bridge	W31		Newport Harbour
W16		Yar Bridge to Yarmouth Common	W32		Central Medina – east

As well as identifying and provisioning for local variability, it is important that flood risk and coastal erosion are managed in a strategic and consistent manner across the Isle of Wight. Consequently, Option Development Units are grouped into Strategy Management Zones (SMZs) to ensure the delivery of broader aims and objectives of the Strategy.

There are six Strategy Management Zones, each of which comprises one or more Option Development Units as shown in Table 1-2. An overview of the SMZs is shown in Figure 1-2.

The WFD assessment has been undertaken at the scale of the Option Development Units, the smallest assessable units within the Strategy.

Table 1-2: Strategy Management Zones and corresponding Option Development Units

Strategy Management Zones	Area Description	Option Development Units	SMP Policy[7]
SMZ1: Needles Headland	Fort Redoubt to southern limit of Totland Bay	W1	NAI
SMZ2:Totland and Colwell Bays	Southern limit of Totland Bay to Fort Victoria	W2	HTL
		W3	
		W4	

7 The SMP policy describes how each stretch of shoreline is most likely to be managed to address flood and/or erosion and for each of these one of four different management policies are agreed, as follows NAI – No Active Intervention, HTL – Hold the Line, MR – Managed Realignment or ATL - Advance the Line

Strategy Management Zones	Area Description	Option Development Units	SMP Policy[7]
		W5	NAI
		W6	HTL then NAI
		W7	NAI
SMZ3a: Yarmouth coast	Yarmouth town and Fort Victoria to Port la Salle	W8	HTL then NAI
		W9	HTL
		W15	HTL
		W16	
		W17	
SMZ3b: Western Yar Estuary	Western Yar Estuary shoreline including Thorley Brook and Barnfields Stream	W10	NAI
		W13	NAI
		W14	HTL then MR
SMZ3c: Freshwater	Freshwater Bay, Freshwater village and the Causeway	W11	HTL
		W12	
SMZ4: Newtown Coast	Bouldnor cliff to Thorness Bay (including Newtown Estuary)	W18	NAI
		W19	
		W20	
SMZ5a: Gurnard Luck and Gurnard cliff	Gurnard Luck / Gurnard Marsh area	W21	HTL then NAI
		W22	NAI
SMZ5b: Gurnard to Cowes Parade	Cowes headland, from Gurnard Bay to Cowes Parade	W23	HTL
SMZ6a: Cowes and East Cowes	Cowes: Cowes Parade to Medina Wharf. East Cowes: Shrape Breakwater to Kingston Road Power Station	W24	HTL
		W25	
		W31	HTL
SMZ6b: Medina Estuary and East Cowes Outer Esplanade	Medina Wharf and Kingstone Road Power Station south to Newport Harbour and Shrape Breakwater to Old Castle Point	W26	NAI
		W27	HTL
		W28	NAI
		W30	NAI
		W32	HTL then NAI
SMZ6b: Newport Harbour	Newport Harbour and Quayside	W29	HTL

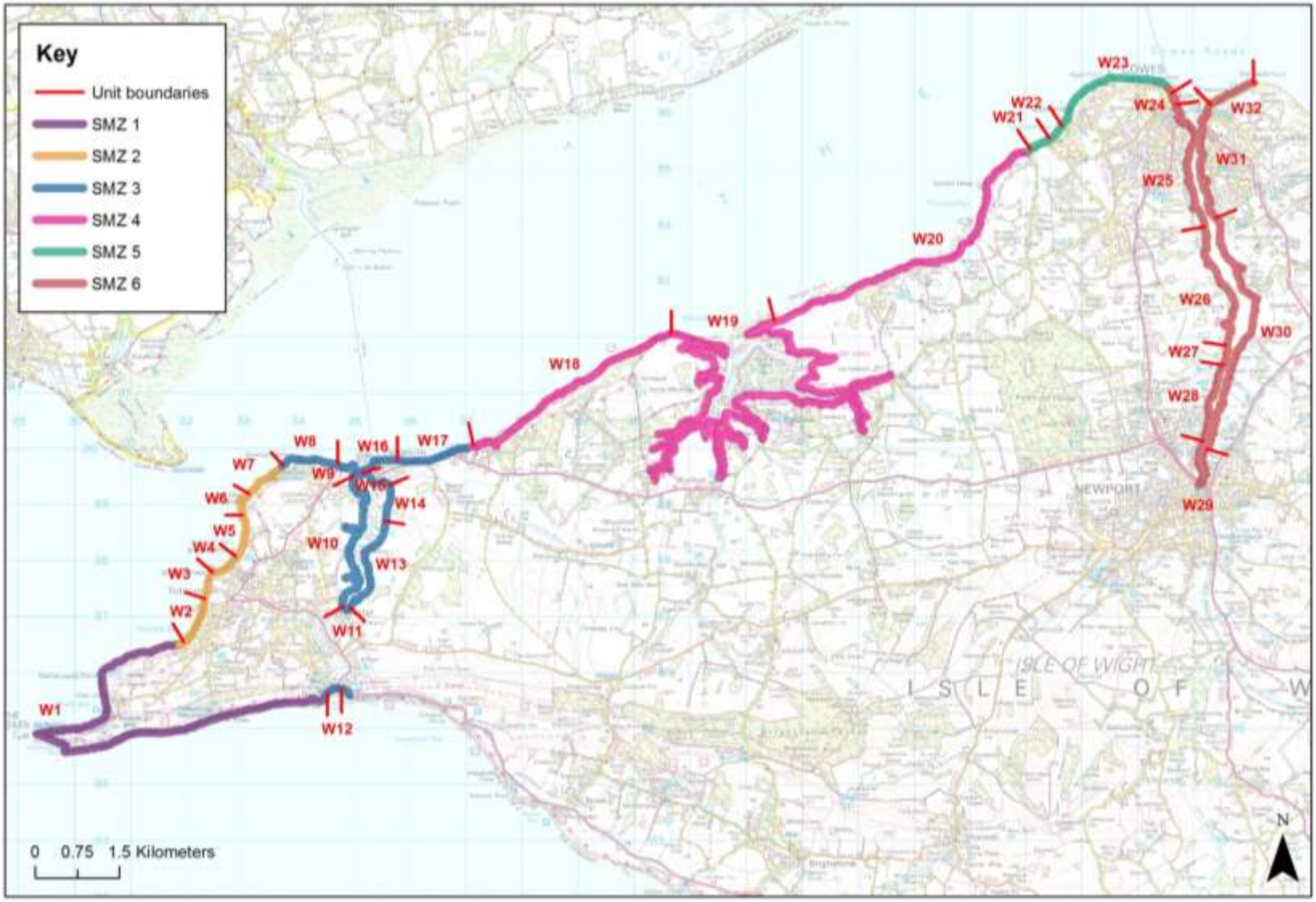


Figure 1-2: Option Development Units and Strategy Management Zones

1.5 The Water Framework Directive

The WFD was passed into UK law in 2003 and combines water quantity and quality issues together. An integrated approach to the management of all freshwater bodies, groundwaters, transitional (estuarine) and coastal waters (TraC) at the river basin level has been adopted. It effectively supersedes all water related legislation which drives the existing licensing and consenting framework in the UK.

The overall requirement of the Directive is that all waterbodies must achieve "Good Status" by 2027 unless there are grounds for derogation. It also requires that environmental objectives be set for all waterbodies to either maintain Good Status, or to move towards Good Status if a waterbody is currently failing its target.

River Basin Management Plans (RBMPs) developed for each River Basin District (RBD) (originally developed in 2009 and due for revision in late 2015) set out the current status classification of all waterbodies within that District, as well as the objectives and measures required to maintain or improve the current Status of each waterbody.

The West Wight Coastal Strategy lies within the boundaries of the South East RBMP[8]. During the time of developing this WFDa, consultation on the updated draft RBMPs is currently ongoing. Consequently, the information collated and assessed within the report has been sourced from both the published 2009 RBMP and the draft 2015 consultation version of the RBMP[9,10]. Wherever possible the most up to date information has been acquired, yet this has been used cautiously and verified where possible through comparison with previous trends and information.

1.5.1 Ecological Status of Potential

Waters must sustain or achieve good ecological and chemical status, in order to protect human health, water supply, natural ecosystems and biodiversity. The status and objectives of waters are defined according to inter-linked biological, chemical and physical (morphological) parameters.

Waterbodies that have not been heavily modified for human uses should be protected or improved to **good ecological status** or better.

Ecological status is defined by the biological condition or health of a waterbody, in combination with water quality and physical conditions that underpin biological conditions. The classification of ecological status considers the abundance of aquatic flora and fauna, physical habitat availability (hydromorphology), and water quality factors such as the availability of nutrients, salinity, temperature and pollution by key chemical pollutants.

Artificial Waterbodies (AWBs) and Heavily Modified Waterbodies (HMWBs) are waterbodies that have been defined as unable to achieve natural conditions due to the legacy and continuation of socio-economic uses. Therefore AWBs and HMWBs have a target to achieve **good ecological potential**, which recognises the continuing need for waterbody uses, whilst making sure that ecological benefits are implemented as far as possible.

The main focus of this WFDa is therefore to ensure that the proposed West Wight Coastal Strategy cannot result in any deterioration of the waterbody, and that ecological improvements are implemented wherever possible so that the waterbody reaches **good ecological potential**.

[8] https://www.gov.uk/government/publications/south-east-river-basin-management-plan

[9] https://consult.environment-agency.gov.uk/portal/ho/wfd/draft_plans/consult?pointId=s1405418101234#section-s1405418101234

[10] http://environment.data.gov.uk/catchment-planning/WaterBody/GB530603911403

1.5.2 *Biological, Hydromorphological, Physico-Chemical and Chemical Quality Elements*

Waterbody ecology and biodiversity are dependent on the physical and chemical qualities of host aquatic habitats, riparian zones and the wider catchment. Ecological status is defined in the WFD according to:

- Biological elements
- Elements supporting the biological elements, i.e. hydromorphological elements and chemical / physico-chemical elements.

Figure 1-3. For example the hydromorphology of a waterbody is described according to hydrology, morphology and downstream and floodplain continuity. In turn, each element group is described according to several different classifications. For example, morphological conditions are classified according to river depth and width variation, the structure and substrate of the river bed, and the structure of the riparian zone.

The overall ecological status or potential of a waterbody is based on a 'one out, all out' principle, i.e. the worst single condition determines the overall status. Ecological quality can be driven by a single underlying factor, for example the concentration of one chemical substance exceeding the tolerance range of a particular species, or the structure and substrates of a river bed not providing suitable spawning or life-stage habitats.

1.5.3 *Surface Water Classification*

The WFD classification scheme for surface waterbody ecological status includes five categories: high, good, moderate, poor and bad. 'High status' means no or very low anthropogenic pressures. 'Good status' means a slight deviation from natural conditions. 'Moderate status' means moderate deviations from natural conditions that allow for human use of waterbodies, and so on.

Surface water bodies are classified according to their ecological status and their supporting physical and chemical status. The chemical status of a watercourse is defined by the concentrations of a range of key pollutants. This is assigned on a scale of good or not good.

1.5.4 *Groundwater Classification*

Groundwater classifications are slightly different to surface water, since good chemical and quantitative status is always set as an objective. The WFD focus for groundwater is on detecting and stopping pollution of groundwater bodies, which are resources for both surface water bodies and human consumption. Geological data has been used to identify distinct volumes of water in underground aquifers, and European law limits abstraction to a portion of the annual recharge.

Groundwater quantitative status is defined by the quantity of groundwater available as base flow to watercourses and water-dependent ecosystems, and as 'resource' available for use as drinking water and other consumptive purposes. It is assessed using four classifications or supporting elements, all of which are assigned on a scale or good or poor:

- Saline or other intrusions
- Surface water
- Groundwater dependent terrestrial ecosystems (GWDTE's)
- Water balance

Chemical status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of

groundwater available for drinking water purposes. It is assessed using five classifications or supporting elements, all of which are assigned on a scale of good or poor:

- Saline or other intrusions
- Surface water
- GWDTE's
- Drinking Water Protected Areas (DrWPA's)
- General quality assessment.

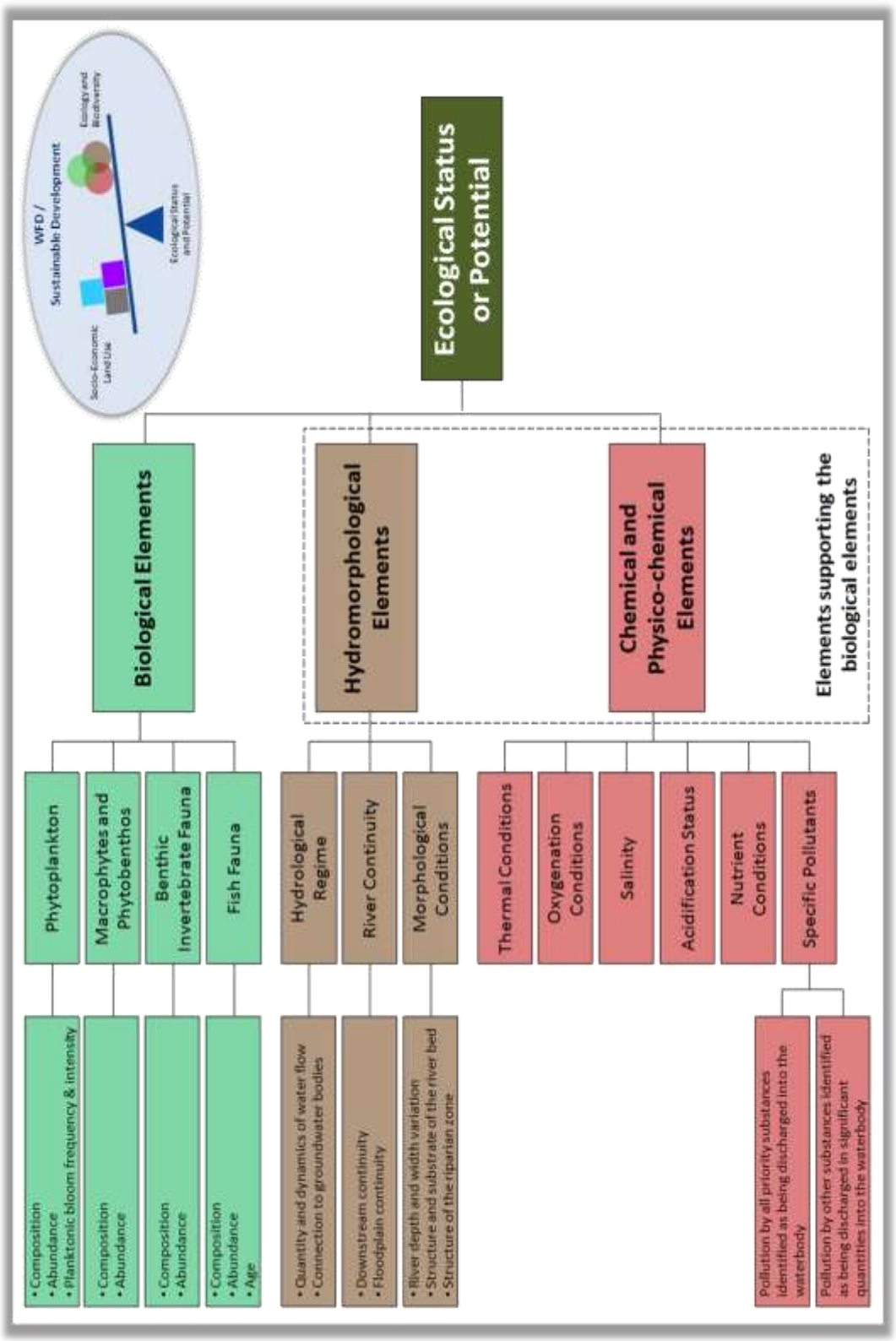


Figure 1-3: WFD Classification Elements

1.5.5 WFD Objectives

The WFD contains surface water Environmental Objectives, which aim to prevent a negative change to the status of the waterbody, which could be caused by a deterioration of any of the biological, physico-chemical or hydromorphological quality elements listed in Annex V of the WFD, as shown in Table 1-3 below. The Environmental Objectives taken from Article 4 of the Water Framework Directive (WFD) have been defined by guidance issued by the Environment Agency for use within SMPs[11]. These will be used for consistency in this assessment and are detailed below in Table 1-4[12].

Table 1-3: Biological, physico-chemical or hydromorphological Quality Elements

Quality Elements	Description
Biological assessment	Uses numeric measures of communities of plants and animals (for example fish and rooted plants)
Physico-chemical assessment	Looks at elements such as temperature and the level of nutrients, which support the biology
Hydromorphological	Looks at water flow, sediment compositions and movement, continuity (in rivers) and the structure of physical habitat

Table 1-4: Environmental Objectives in the WFD

Objectives	Description
WFD1	No changes affecting high status sites
WFD2	No changes that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential
WFD3	No changes which will permanently prevent or compromise the environmental objectives being met in other waterbodies
WFD4	No changes that will cause failure to meet Good groundwater status or result in a deterioration in groundwater status

There is also a duty to enhance and restore waterbodies where possible and by implication there is a need to ensure that actions do not prevent currently failing waterbodies from reaching a Good Status or Potential. In order to meet the objectives, any activity which has the potential to have an impact on any of the Quality Elements must be assessed. The preferred Strategy options will therefore be considered to ensure there are no future failures in meeting the Environmental Objectives, and any failures that do occur can be defended.

Appendix C details the preferred policies for each of the Option Development Units within PDZs 6, 7 and 1.

[11] Environment Agency (2009) Assessing SMP against the Requirements of the WFD – Guidance and background information

[12] Table 11 of Assessing shoreline management plans against the requirements of the Water Framework Directive, Guidance and Background Information, Environment Agency, 2009

1.5.6 *Isle of Wight Shoreline Management Plan 2 (2010) Water Framework Directive Assessment*

The Isle of Wight SMP 2 was assessed under the requirements of the WFD[13]. For all waterbodies in the Isle of Wight SMP 2 area, the hydromorphological parameters that could potentially be changed by SMP policies, with potential impact on the Biological Quality Elements (BQEs) were identified. BQEs that potentially could be affected by SMP policies for each waterbody were identified and the potential impact of the SMP policy for each Policy unit was assessed in relation to aspects of the WFD. A summary of the assessment impact for each of the Option Development Units within the Strategy area is provided in Appendix D.

The WFD assessment of the SMP2 policies for each PDZ and the water body summary of achievement of WFD Environmental Objectives identified that there is potential that Environmental Objectives WFD2 and/or WFD3 may not be met in five of the TraC water bodies including:

- Solent;
- Medina Estuary; and,
- Western Yar.

A Summary Statement was completed for each of the waterbodies which could be adversely affected by the proposed policy. The Summary Statement outlines the reasons behind selecting the final SMP policy and any mitigation measures that have been incorporated into the policies. A summary of the Summary Statements for each of the waterbodies impacted within the Strategy area is provided in Appendix D

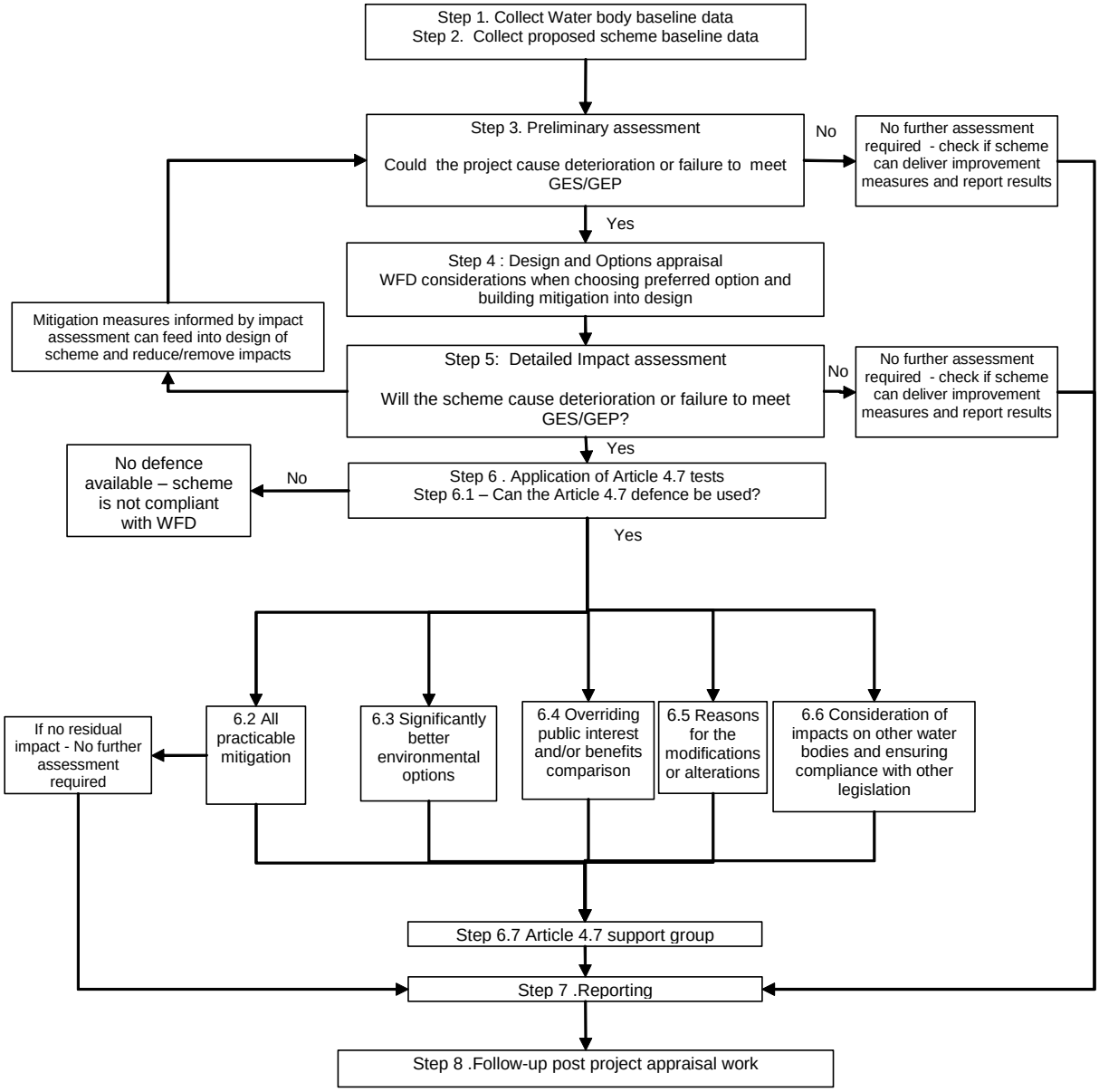
[13] Isle of Wight Shoreline Management Plan 2, Appendix J – Water Framework Directive Assessment (December 2010), Royal Haskoning

2. Assessment Methodology

The methodology used for this assessment has been taken from the Environment Agency document *'Assessing new modifications for compliance with WFD: detailed supplementary guidance, Environment Agency, 2010'*. This follows an eight step process which is illustrated below in Figure 2-1.

Step 1 of the process is presented within Section 3 of this report and outlines the baseline data which covers the West Wight study area. This baseline data and the preferred options which have been identified for each ODU are then used to carry out Step 3, the preliminary assessment. The preliminary assessment is present in Section 5 of this report. Following on from the preliminary assessment, if any of the preferred options are shown to potentially cause deterioration or failure to meet GES/GEP then a detailed impact assessment has been carried out.

Figure 2-1: Overview of the WFD Assessment Process



3. Waterbody Baseline Assessment

The first stage of the WFD assessment process is to identify waterbodies within the Strategy area and to collect relevant data on their current status to ascertain whether there is the potential for waterbodies to be affected by the implementation of the Strategy. This stage also involves identifying if there are any water dependent WFD 'protected areas' which could be impacted by the Strategy and any planned waterbody measures.

3.1 Waterbodies within the Study Area

Water quality issues arise on the Isle of Wight's inland, estuarine, and coastal waterbodies as a result of a large number of domestic septic tanks, pressure on the sewage system from rural and urban areas, fertilizer and pesticide run-off from agricultural land.

Each of the transitional, surface, and coastal waterbodies within the study area are classified as Heavily Modified Waterbodies (HMWB) or Artificial Waterbodies. Over 90% of rivers within the Isle of Wight have been modified for water abstraction, agriculture, navigation and flood protection measures. Modification involves straightening and the inclusion of man-made river banks and structures such as weirs. Such modifications can damage natural habitats and natural movement of prevent fish and other wildlife between different sections of the network.

As a result of modification, the waterbodies are therefore classified in terms of potential. The majority of the waterbodies within West Wight are classified as moderate overall potential with the objective of achieving 'Good Potential' status by 2027.

Information related to waterbody status is summarised in Table 3-1 below. Wherever possible the most up-to-date data relating to water quality has been collated through use of the following sources:

- Environment Agency's Catchment Data Explorer;
- South-East River Basin Management Plan Catchment Summary (2015) for the Isle of Wight; and,
- Draft Update to the South-East River Basin Management Plan.

It should be noted that there are fewer waterbodies reported within the more recent Catchment data Explorer and RBMP catchment summary when compared to the 2009 South East RBMP.

Subsequent to the release of the 2009 RBMP, a WFD waterbody review was conducted by the Environment Agency in 2013 to identify which waterbodies should be scoped in for further assessment within the 2015 RBMP update and reporting as to compliance with the WFD's environmental objectives. Consequently, as a result of the 2013 WFD waterbody review, a number of smaller 1st cycle waterbodies were redefined as 'non-reportable waterbodies'. These non-reportable waterbodies will no longer have classification and objectives for the 2nd cycle of the river basin management planning.

Nationally, the vast majority of waterbodies have remained unchanged or have undergone minor changes. However, on the Isle of Wight, the changes related to non-reportable waterbodies were more significant with approximately 20 of the 1st cycle waterbodies from 2009 (particularly those with very small coastal catchments) being defined as 'non reportable waterbodies' for the draft 2015 RBMP production.

Whilst these waterbodies may no longer be considered as reportable under the WFD, the intention is still for the waterbodies to be protected and for communities to enhance such features where practicable.

Table 3-1 identifies the waterbodies within the Strategy Area which remain reportable under the 2nd cycle (2015) of the river basin management planning process, and which will be taken forward within this WFD assessment. It also includes their current 'potential' classification. The following 1st cycle waterbodies which have been redefined as 'non-reportable waterbodies' include:

- Western Yar (River);
- Thorley Brook;
- Barnfields Stream;
- Great Thorness Stream;
- Little Thorness Stream;
- Gurnard Luck;
- Dodnor Creek;
- Alverstone Stream;
- Ningwood Stream:
- Isle of Wight;
- Fleetlands Cope Stream; and,
- Rodge Brook.

An initial review of the potential impact pathways from the Strategy options was undertaken to determine which of the waterbodies and related WFD objectives could potentially be affected by the Strategy. This review concluded that all of the surface waterbodies could be scoped out of the assessment, as the management policies proposed will not impact any of the surface waterbodies. The preferred option for the coastal defences in the location where each of the waterbodies discharges is either 'Hold the Line' (HTL) or 'No Active Intervention' (NAI) by monitoring and maintaining the existing defences. The policy of HTL by maintaining the existing defences or NAI means that there will be no encroachment seaward due to the management policies. These waterbodies will therefore not be considered further in this WFD assessment.

The review was also undertaken on groundwater bodies and concluded that they could be scoped out of the assessment, as the SMP WFDa concluded that groundwater bodies would be impacted as a result of the SMP2 policies as there is no current evidence of saline intrusion since they are designated as 'Good Status.' Furthermore, the proposed Strategy options do not include any piled defences and are therefore unlikely to interact with / intercept groundwater bodies in the area. In addition, no Source Protection Zones (SPZ) are defined within the Strategy area. Therefore, groundwater has been scoped out of this WFD assessment.

The five coastal and transitional waterbodies have the potential to be impacted by Strategy options and have therefore been screened into the assessment and relevant data collected for them.

Table 3-1: Waterbodies and WFD Status within the Strategy Area

	Waterbody	SMZ	Waterbody ID	Hydromorphological Status	Overall Water Body	Considered further in WFDa
Coastal and Estuarine Waters	Solent (Coastal)	All	GB650705150000	Heavily Modified	**Overall: Moderate** *Chemical Quality:* Fail *Biological Quality:* Moderate Potential *Physico-Chemical:* -	**Yes**
	Dorset/Hampshire (Coastal)	SMZ1	GB620705550000	Heavily Modified	**Overall: Good** *Chemical Quality:* Does not require assessment *Biological Quality:* Good Potential *Physico-Chemical:* -	**Yes**
	Western Yar (Transitional)	SMZ3	GB520710101800	Heavily Modified	**Overall: Moderate** Chemical Quality: Good Biological Quality: Moderate Physico-Chemical: Moderate	**Yes**
	Newtown River (Transitional)	SMZ4	GB520710101700	Not designated artificial or heavily modified	**Overall: Moderate** Chemical Quality: Good Biological Quality: Moderate Physico-Chemical: Moderate	**Yes**
	Medina (Transitional)	SMZ6	GB520710101600	Heavily Modified	**Overall: Moderate** *Chemical Quality:* Good *Biological Quality:* Moderate *Physico-Chemical:* Moderate	**Yes**
Surface Water	Lukely Brook	SMZ6	GB107101006250	Heavily Modified	**Overall: Poor** *Chemical Quality:* Does not require assessment *Biological Quality:* Poor Status *Physico-Chemical:* -	**Screened out**
	Medina (River)	SMZ6	GB107101005990	Heavily Modified	**Overall: Moderate** *Chemical Quality:* Does not require assessment *Biological Quality:* Moderate Potential *Physico-Chemical (Ammonia):* High	**Screened out**
	Caul Bourne	SMZ4	GB107101006020	Heavily Modified	**Overall: Moderate** *Chemical Quality:* Does not require assessment *Biological Quality:* Moderate Potential *Physico-Chemical (Ammonia):* High	**Screened out**

	Waterbody	SMZ	Waterbody ID	Hydromorphological Status	Overall Water Body	Considered further in WFDa
Groundwater	Solent Group	All	GB40702G501000	N/A	Current Quantitative Quality: Good Current Chemical Quality: Good Risk of Saline Intrusion:	**Screened out**
	Central Downs Chalk	SMZ1	GB40701G503200	N/A	Current Quantitative Quality: Poor Current Chemical Quality: Good Risk of Saline Intrusion:	**Screened out**
	Lower Greensand	SMZ1	GB40701G502900	N/A	Current Quantitative Quality: Poor Current Chemical Quality: Good Risk of Saline Intrusion:	**Screened out**

As there are a number of failing waterbodies within the Study Area, the South East (RBMP 2009 set a series of measures for these waterbodies to bring them up to Good Potential/Status. The 2009 RBMP concluded that it is disproportionately expensive and technically infeasible to achieve Good Potential/Status by 2015, hence the target for attainment of Good Potential/Status is 2027. The mitigation measures identified by the 2009 RBMP that were perceived to be required to reach Good Potential/Status are given below in Appendix B.

Since 2009 a number of measures have been undertaken in the study area in partnership with a number of varying stakeholder groups including:

- On the River Medina the Newport Rivers Group and Natural Enterprise have restored in-channel habitat at key points along a 3km urban reach;
- Long stretches of the Medina and other watercourses have been cleared of Himalayan Balsam and other non-native species as part of a three year 'Plant Positive' programme;
- Through the Catchment Sensitive Farming Partnership, Natural England and the Wildlife Trust are addressing sources of agricultural run-off into the water environment by giving advice and grants to improve farm infrastructure and encourage better farm and land practices;
- Saltmarsh monitoring is underway on the Medina and Western Yar to watch the growth of algae; and,
- There is a "Green Blue Campaign" which is encouraging boat users to reduce faecal discharge into the sea.

Despite these actions, compliance has not improved since 2009. Whilst mitigation measures have not yet been identified for each waterbody in the Draft RBMP (2014), catchment wide mitigation measures have been defined within the draft RBMP as follows:

Improve modified physical habitats:

- Removal or easement of barriers to fish migration;
- Improvement to condition of channel/bed/and/or banks/shoreline;
- Improvement to condition of riparian zone and/or wetland habitats; and,
- Vegetation management.

Managing pollution from waste water

- Mitigate/remediate point source impacts on receptor; and,
- Reduce point source pollution at the source.

Manage invasive non-native species

- Mitigation, control and eradication (to reduce extent).

Manage Pollution from rural areas

- Mitigate/remediate diffuse pollution impacts on the receptor.

3.1.1 Definition of WFD features and issues

The following Biological Quality Elements (BQEs) have been considered for potential impact as a result of the options considered within the Strategy.

Phytoplankton is photosynthetic organisms that live free-floating within the water column. They are included as a BQE as they are an indicator organism for the levels of nutrients within the

water. Seasonal changes that result in algae blooms during March to May and a second smaller peak between August and October (in temperate altitudes) are thought to be largely driven by anthropogenic influences such as nutrient rich runoff near outfalls from rivers, agriculture runoff or coastal sewage treatment works. Changes in phytoplankton populations therefore usually occur on a large spatial scale and it is unlikely that localised changes to water depth, turbidity and thermal regime (linked to water depth in this case) could result in community changes in the immediate and sheltered coastal fringe. Therefore, it is not considered that the preferred Strategy options will impact on phytoplankton significantly at the waterbody level, thus this BQE will not be considered any further.

Macroalgae are photosynthetic, nonvascular plants commonly known as seaweeds. Seaweeds are adapted to the present conditions along the coastline and will therefore be susceptible to changes in current velocity, abrasion/sediment dynamics or salinity levels. However, it is unlikely that any policy type will result in any significant changes at the waterbody level and is therefore not considered any further with respect to macroalgae.

For the purposes of this assessment, angiosperms are defined as native seagrasses by the WFD UK TAG, namely Zostera (eelgrass) and Ruppia spp. They are adapted to shallow sheltered areas with little wave action and grow in sand and mud, and can form dense beds. Angiosperms have therefore been considered, although as with macroalgae, it is unlikely that any policy type will result in any significant changes in salinity at the waterbody level and salinity is therefore not considered any further with respect to angiosperms.

Benthic/macro invertebrates that inhabit the coastal fringe will be sensitive to changes in their habitat structure, such as changes in the plant (macroalgae and macrophyte) communities. Changes to plant communities, through changes in current velocity, abrasion/sediment dynamics or salinity levels as discussed above, could therefore impact on the invertebrates living within the plant communities. Benthic/macro invertebrates could also be directly affected by changes in the connectivity with the riparian zone, changes to the defence footprint and the beach water table, changes in current velocity, abrasion/sediment dynamics affecting levels of light or salinity levels as discussed above. These impacts will be explored in greater detail at scheme level.

Table 3-2 below shows the BQEs within the Coastal Strategy area that could be affected by small scale changes to hydromorphology impacting on ecology for each WFD waterbody as a result of the Strategy. The key physical parameters which are important for the BQEs of each waterbody and may be affected by decisions made within the Strategy are also shown within the table.

Environmental Objective WFD1, as given above in Table 1-4, is not applicable as there are no high status waterbodies within the Strategy area. Environmental Objectives WFD4, as given above in Table 1-4, is not applicable as groundwater bodies have been scoped out of the assessment. Objectives WFD1 and WFD4 are therefore not listed below in Table 3-2.

Table 3-2: Potential Features and Issues to consider within the Strategy area

Waterbody	ODU	BQE	Potential for change in hydro-morphological or physical parameter	Waterbody classification and environmental objectives which could be affected	Potential for Strategy to create impact
Solent, Dorset/Hampshire, Medina, Western Yar, Newtown River	1-32	Benthic invertebrates	Potential changes to benthic invertebrates through: the beach water table	Classification: Moderate Ecological Potential (Heavily Modified Waterbody)	Yes

Waterbody	ODU	BQE	Potential for change in hydro-morphological or physical parameter	Waterbody classification and environmental objectives which could be affected	Potential for Strategy to create impact
Solent, Dorset/Hampshire, Medina, Western Yar, Newtown River	1-32	Macroalgae	Potential changes to macroalgae through: changes in abrasion (associated with velocity); changes in salinity	Potentially affected Environmental objectives: WFD2: (No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential) WFD3: (No changes which will permanently prevent or compromise the environmental objectives being met in other waterbodies.)	No
Medina, Western Yar, Newtown River	10-15, 19, 25-32	Phytoplankton	Potential changes to phytoplankton through: changes in residence time, water depth and turbidity		No
Solent, Dorset/Hampshire, Medina, Western Yar, Newtown River	1-32	Fish	Potential changes to fish through: heterogeneity of habitat (changes in substrate, provision of shelter); substrate conditions; accessibility to nursery areas (elevation of saltmarshes, connectivity with shoreline); presence of macrophytes		Yes
Solent, Medina, Western Yar, Newtown River	1-11,13-32	Angiosperms (Eelgrass)	Potential changes to due to changes in inundations (tidal regime), sediment loading, land elevation, abrasion (associated to velocity) and light		Yes

3.2 Internationally protected sites

For the study area, the following **water dependent designated sites (**Habitats Directive) are present (see **Figure 3-1: International Nature Conservation Designations** and **Figure 3-2 for designated conservation sites**), for which additional standards will apply and will be included under WFD protected area status assessments within this report (Section 5):

- Solent & Southampton Water SPA and Ramsar site;
- Solent Maritime SAC site;
- South Wight Maritime SAC; and,
- Isle of Wight Downs SAC.

Further information on the designated sites is provided in Appendix A

3.3 Environmental Designations

Where there are sites protected under other European Union (EU) legislation such as the Birds or Habitats Directives and Bathing Water Directive and which have a water dependence, the WFD aims for compliance with any relevant standards or objectives for these sites in addition to the specific objectives of the WFD. Where a site is protected under another EU Directive, and the targets set by the WFD would be insufficient to meet the objectives of the other relevant environmental Directive, the more stringent targets would apply. If the more stringent objectives are not met, the WFD objectives are also failed for protected area status.

The project frontage overlaps several water dependent internationally designated nature conservation sites including Special Protected Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. The internationally designated sites which could potentially be affected by the Strategy and connected to the water environment and hence this WFD assessment are detailed in Appendix A.

Figure 3-1: International Nature Conservation Designations shows the location of internationally designated nature conservation sites.

There are also a number of nationally and locally designated nature conservation sites including Sites of Special Scientific Interest (SSSI) along with national nature reserves which are water dependent.

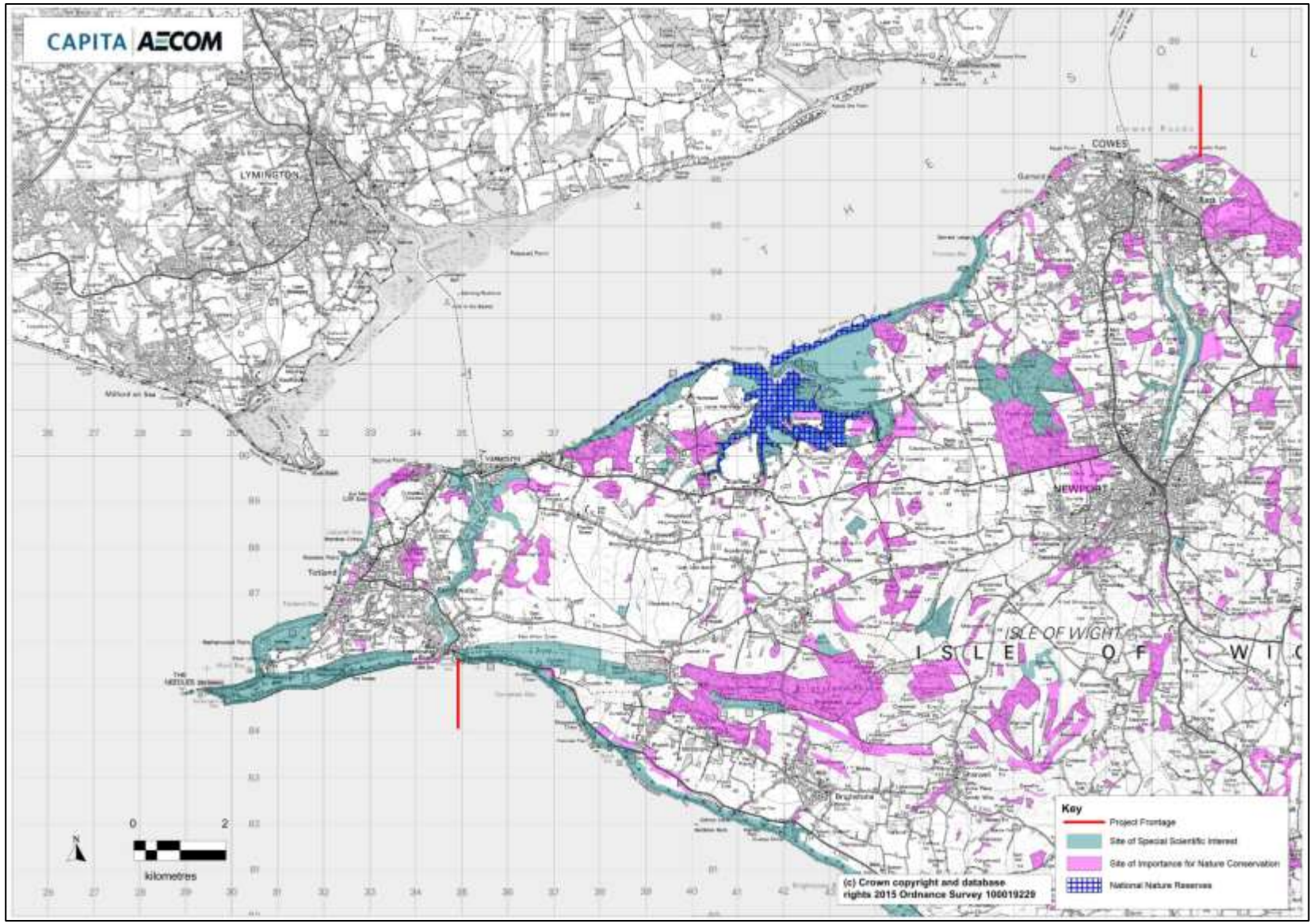


Figure 3-2Figure 3-2 shows the location of nationally and locally designated sites.

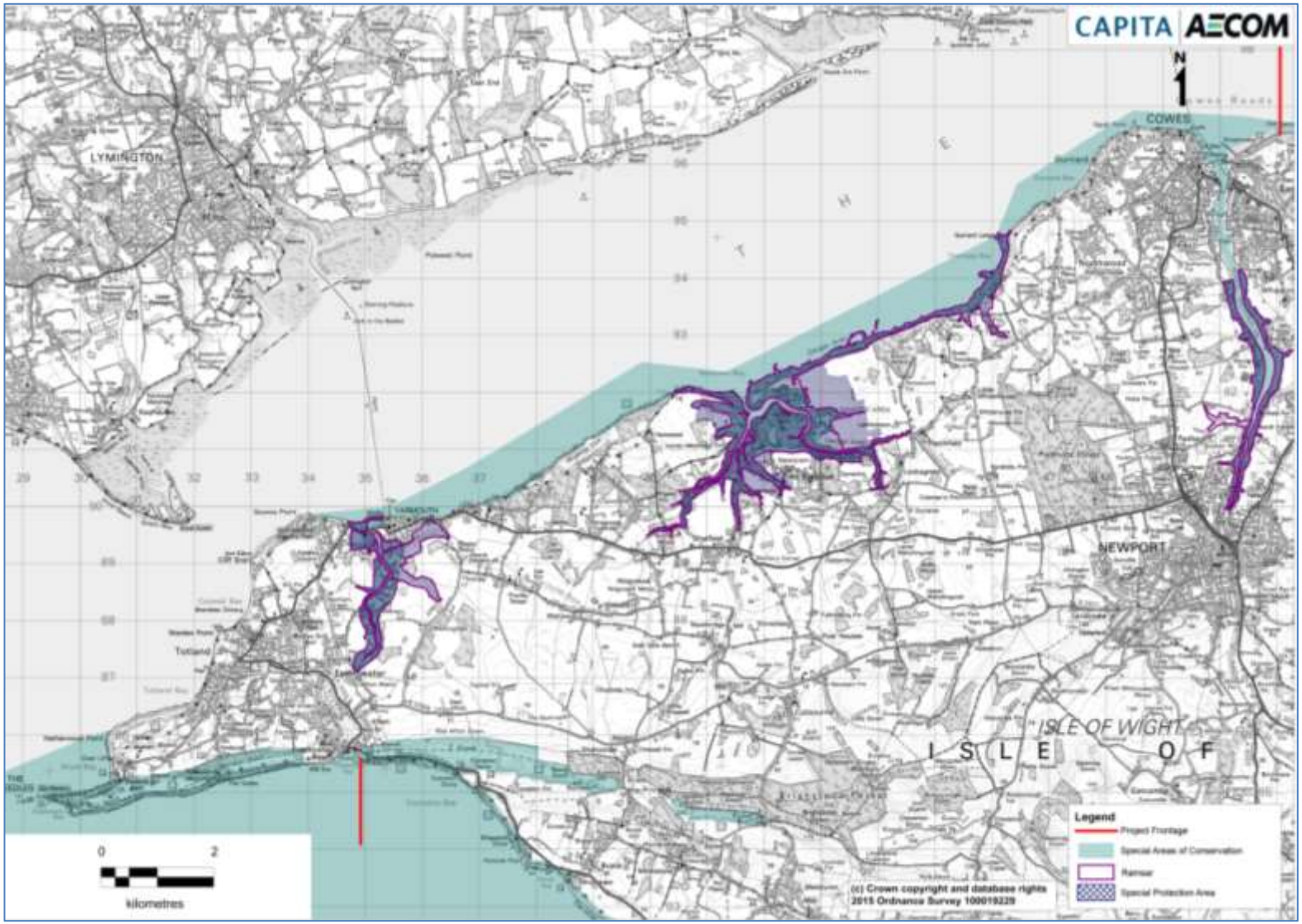


Figure 3-1: International Nature Conservation Designations

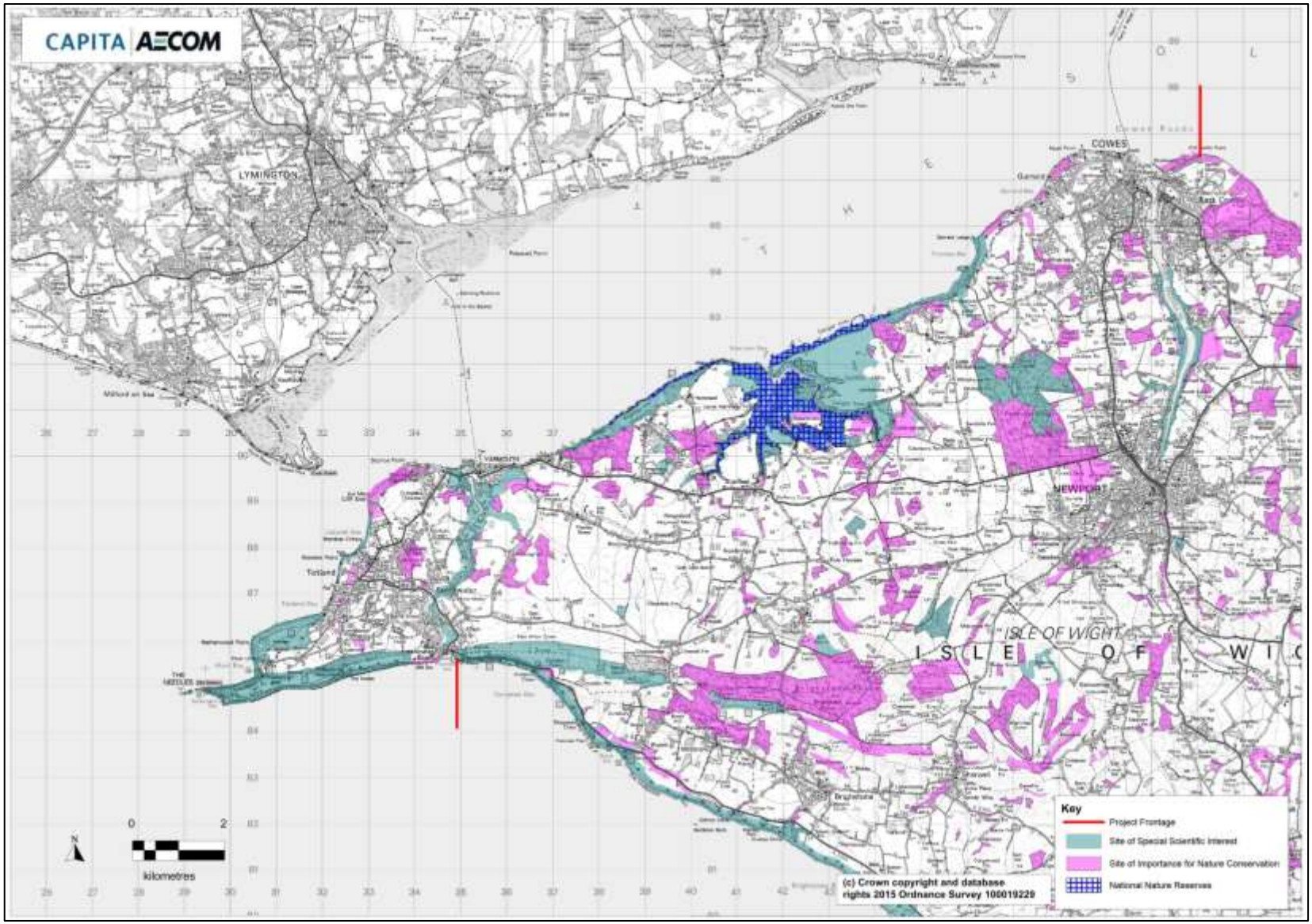


Figure 3-2: National Nature Conservation Designations

3.4 Designated Bathing Waters

The WFD requires member states to establish a register of protected areas including bodies of water designated as recreational waters (bathing Water). From 2015 onwards, the objectives for Bathing Waters (as defined by the revised Bathing Water Directive) will be to preserve, protect and improve the quality of the environment and to protect human health.

The Revised Bathing Water Directive also has the aim of protecting human health and improving management practices of bathing waters whilst standardising the information which is made available to amenity users. The Revised Bathing Water Directive complements the WFD.

There are four designated bathing waters[14] along the project frontage:

- Totland Bay;
- Colwell Bay;
- Gurnard Bay;
- Cowes.

Each of the identified bathing waters has the potential to be impacted through any alteration to wastewater discharge locations, or through disturbance of sediments affected by wastewater discharges. All four sites achieved either the 'good' or 'excellent standard', meaning the bathing water meets the criteria for the stricter guideline standards of the Revised Bathing Water Directive (76/0160/EEC)[15].

Bathing Water profiles have been produced for all designated Bathing Waters. These profiles provide information on the factors which affect water quality in these areas and measures to improve water quality in these areas.

An initial review of the potential impact pathways from the Strategy options was undertaken to determine if any of the designated bathing water could potentially be affected by the Strategy.

The Strategy would not impact directly on the frequency or location of discharges which could affect Bathing Waters. The only potential impact identified was disturbance of sediment (during construction) containing potentially settled bacteria. To prevent an impact on bathing water quality within the Strategy area construction work will not be carried out up to two days after any discharge via an outfall, until the exposure risk has reduced. Construction can also be carried out to avoid sensitive periods and construction methods adopted to avoid the uncontrolled release of sediments and contamination, for example silt curtains.

This review therefore concluded that each of the bathing waters could be scoped out of the assessment.

3.5 Designated Shellfish Waters

For the study area, the following designated Shellfish Waters are present (see above), for which additional standards will apply:

- Totland;
- Yarmouth;
- Newtown;

[14] http://environment.data.gov.uk/bwq/explorer/index.html#

[15] http://environment.data.gov.uk/def/bwq-cc-2012/G

- Cowes; and,
- Medina.

One of the main changes of the RBMPs is the inclusion of additional detail on objectives and exemptions following the repeal of certain directives including the Shellfish Waters Directive (2006/113/EEC). The Shellfish Waters Directive was repealed and requirements transferred under the Water Framework Directive. The WFD requires member states to establish a register of protected areas including the protection of economically significant aquatic species (shellfish). Under the WFD, designated shellfish protected areas will be retained and actions plans have been developed for each of the 98 shellfish waters in England which aim to describe the challenges facing water quality in the area and how these issues will be managed sustainably[16].

The majority of the project frontage is designated as Shellfish Waters and Shellfish Harvesting Areas largely for the harvesting of Native Oysters (see above), for which additional standards will apply:

- Totland;
- Yarmouth;
- Newtown;
- Cowes; and,
- Medina.

The above Shellfish Waters have a number of associated monitoring points. A review of recent monitoring records[17] and subsequent classifications has shown that poor water quality has led to the prohibited use of certain shellfish waters in the West Wight area.

[16] https://ea.sharefile.com/download.aspx?id=se87464f73da4583a

[17] http://www.cefas.defra.gov.uk/our-science/animal-health-and-food-safety/food-safety/classification-and-microbiological-monitoring.aspx

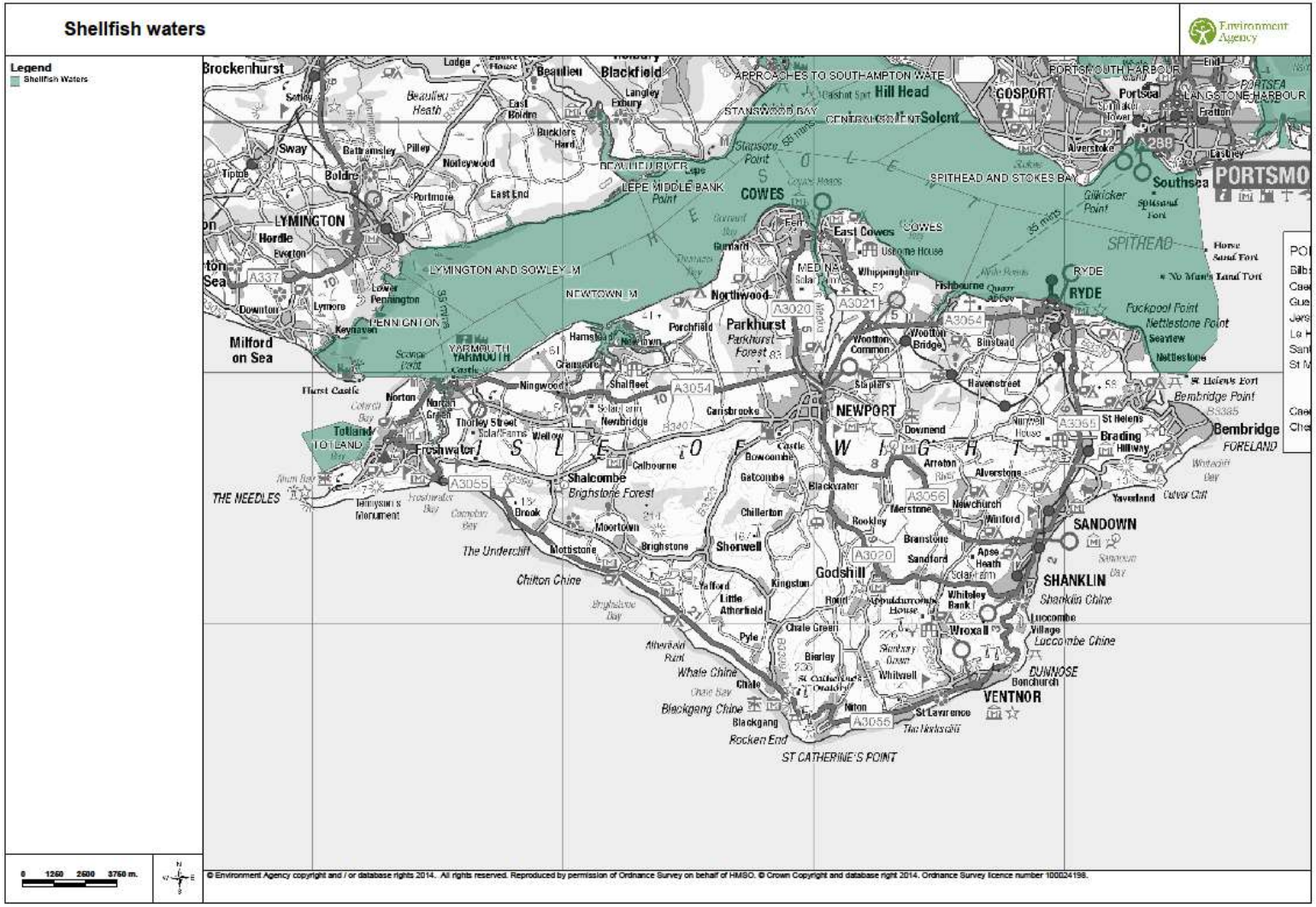


Figure 3-3: Shellfish Waters

4. Collect Proposed Scheme (Options) Data

The aim of this stage of the assessment is to collect information on the proposed development. The preferred options, which have been selected from the appraisal process (discussed further within Strategy Appendix J - Option development and Appraisal), are summarised below for each SMZ.

4.1 SMZ 1 – Needles Headland (ODU W1)

4.1.1 Summary of preferred options

Preferred option: Option 1 – Do Nothing

The preferred option for this zone is to ***Do Nothing.*** This will involve allowing natural processes to continue, with privately funded maintenance of existing assets permitted (subject to normal consents). The Isle of Wight Council will not repair or maintain existing defences, and no new defences will be permitted where they are not already present.

It recognised that local erosion risks to businesses, people and coastal footpaths may need to be mitigated or adapted to on an asset by asset basis. Therefore, privately funded maintenance of the limited existing coastal structures will be permitted subject to gaining the necessary consents. In addition, the Old Needles Battery site is a key heritage feature within this zone and there is a recognition that this asset may be at threat of erosion in the longer term and localised adaption or mitigation may be required.

The preferred option will work with nature as much as possible to maintain or enhance the natural environment. It will ensure that the natural landscape of the Heritage Coast, which draws in many visitors, is allowed to evolve in a largely unspoilt manner. The ongoing erosion of the chalky and sandy cliffs will also provide an additional benefit through the continued supply of sediment which is important for nourishing the beaches of the adjacent Totland and Colwell Bays.

Table 4-1: SMZ1 Preferred Options

	W1
2015-2025	Do Nothing – natural processes to continue
2025-2055	Do Nothing – natural processes to continue
2055-2115	Do Nothing – natural processes to continue

4.2 SMZ 2 – Totland and Colwell Bays (ODU W2-W7)

4.2.1 Summary of preferred options

Preferred option: Option 2 – Do Minimum

The preferred option for this zone is to ***Do Minimum.*** This will involve maintaining coastal access as long as possible and ensure health and safety compliance (i.e. by maintaining structural requirements in line with health and safety legislation or by limiting public access to areas considered at risk of failure). A Coastal Change Management Area Plan will also be developed and adaptation will be supported by the planning process. Privately funded maintenance of existing private defences will be permitted (subject to gaining the necessary consents).

The preferred option recognises the importance to the community of the seawall and associated coastal access which was highlighted by the large landslip which occurred in December 2012 to the north of the old pier at Totland. Restoration work to the footpath over the recent landslip was completed in 2015 but it is likely that further slips will occur in the future and similar restoration works to re-instate access will be required. Small scale maintenance along the seawalls in the area will also continue, and will help to extend the life of the current defences. However at some point in the future a larger magnitude event causing extensive damage is likely to occur and at this point it may no longer be affordable to maintain or replace the defences.

The Coastal Change Management Area Plan will ensure that future inappropriate development is not permitted within the potential erosion and landslip risk zones and will also provide support to help communities adapt or relocate if an alternative solution is not found. There may also be opportunities for more appropriate or time-limited land uses in such areas.

The Isle of Wight council will continue to explore potential funding options and if sufficient contributions can be sourced, alternative options to better reduce the risks posed by erosion and landsliding could be implemented.

Table 4-2: SMZ2 Preferred Options

	W2-W6	W7
2015-2025	Maintain coastal access and H&S compliance	Do Nothing
2025-2055	Maintain coastal access and H&S compliance & implement CCMA [18]	Do Nothing
2055-2115	Implement CCMA and adaptation	Do Nothing

[18] Coastal Change Management Area -

4.3 SMZ 3 – Yarmouth Area (ODU W8-W17)

4.3.1 Summary of preferred options

SMZ3a - Preferred option: Option 3 – Maintain (and Temporary Flood Barriers) then Improve from 2055

SMZ3a covers Option Development Units W8, W9, W15, W16 and W17. The preferred option is to ***Maintain (and Temporary Flood Barriers) then Improve from 2055.*** This option will involve providing temporary flood barriers to manage and to reduce flooding to the area at significant risk by sustaining a 1 in 75 year (1.33% AEP) standard of protection. From 2055, if funding can be secured, it is the aspiration to improve the protection by implementing new defences (bunds and floodwalls) to manage the long term increase in flood and erosion risk posed by sea level rise.

SMZ3b - Preferred option: Option 4 – Do Minimum (and PLP) with Managed Realignment between 2025 and 2055

SMZ3b covers Option Development Units W10, W13 and W14. The preferred option is to ***Do Minimum (and PLP) with Managed Realignment between 2025 and 2055***. This option involves maintain coastal access (such as the cycle path and footpath access) for as long as sustainably possible and also ensuring health and safety compliance. In addition this option also recommends undertaking privately funded property level protection measures for the small number of residential properties that are at risk of flooding. On the whole this approach will ensure that the Western Yar Valley continues to evolve under natural processes, thus helping preserve the environmentally important habitats both for the Isle of Wight and the greater Solent.

At Thorley Brook the preferred option recommends maintaining the existing defences up to 2025, after which Managed Realignment and intertidal habitat creation is to be implemented to deliver necessary environmental mitigation and compensatory habitat for losses elsewhere. As part of this scheme a new setback flood defence line would also be delivered. However the delivery of this scheme is subject to the Environment Agency securing the required funding, delivery of compensatory grazing marsh through the Regional Habitat Creation Programme, and provision of compensatory high tide roost sites. Following managed realignment the future management of the area would be to maintain the new setback flood defences; allowing Thorley Brook inlet to function and evolve naturally. If this scheme is not delivered, a programme of maintenance to the exiting defences fronting Thorley Brook will continue.

SMZ3c - Preferred option: Option 4 – Maintain (and PLP) then Improve (2055)

SMZ3c covers Option Development Units W11 and W12. The preferred option is to ***Maintain and PLP then Improve (2055).***

At Freshwater Bay (W12), this option will involve maintaining the strategically important defences (seawall) at Freshwater Bay to prevent erosion to key road links and also to prevent a tidal breach to the western Yar Valley. Future refurbishment works to the seawall will be required at the end of the structure's residual life to ensure the continued function of the defence. In the longer term further maintenance and refurbishment works will be required to the defences to prevent erosion and reduce flood risk.

In the Western Yar Estuary, between the Causeway to the edge of Freshwater village (W11), the preferred option involves maintaining existing defences and implementing privately funded property level protection in the short term to address the localised flood risk within this zone. The Causeway and flapped culverts will continue to be maintained to ensure its function is reducing flood risk to Freshwater.

In the medium and long term, it will be necessary to refurbish the existing defences (Causeway) and it is recommended to implement new defences (at Freshwater village) to prevent tidal flooding to commercial and residential properties near to the A3055 at the intersection with Stroud Road (subject to available funding). Here there are a number of residential and commercial properties at significant potential flood risk, mainly under extreme tidal conditions coming from the north (the Western Yar Valley at the Causeway).

In the future if there is a legal requirement to provide compensatory habitat to offset habitat losses that may arise from defending the coastline, as well as the proposed realignment at Thorley Brook (see section 7.4), another area which may be suitable has been identified near Freshwater, from the Causeway westwards along the valley towards the village (near the cycletrack). . If feasible, habitat creation at this area could also be incorporated into a wider flood risk works for Freshwater which would deliver multiple outcomes and potentially unlock partnership funding streams. This opportunity will need to be investigated in more detail in subsequent appraisals.

Table 4-3: SMZ3 Preferred Options

	SMZ3a		SMZ3b	SMZ3c		SMZ3b
	W8	**W9**	**W10**	**W11**	**W12**	**W13**
2015-2025	Maintain coastal access and H&S compliance	Maintain and upgrade / refurbish in corner	Maintain access and H&S compliance	Maintain Causeway and PLP	Maintain seawall	Maintain access and H&S compliance
2025-2055	Maintain coastal access and H&S compliance	Maintain and upgrade / refurbish in corner	Maintain access and H&S compliance	Refurbish and PLP	Upgrade / refurbish and maintain	Maintain access and H&S compliance
2055-2115	Health and Safety works as required	Maintain and upgrade	Maintain access and H&S compliance	Recommend new defences at Freshwater village to prevent tidal flooding to residential and commercial properties near the A3055.	Continued refurbishment and maintain	Maintain access and H&S compliance

	SMZ3b	SMZ3a		
	W14	W15	W16	W17
2015-2025	Maintain	Setback temporary flood barriers. Maintenance elsewhere	Setback temporary flood barriers. Maintenance elsewhere	Maintain
2025-2055	Environmental mitigation / habitat creation	Setback temporary flood barriers. Maintenance elsewhere	Setback temporary flood barriers. Maintenance elsewhere	Maintenance / refurbishment
2055-2115	Do Nothing and maintenance	Upgrade / new defences	Upgrade / new defences	Maintenance

4.4 SMZ 4 – Newtown Coast (ODU W18-W20)

4.4.1 Summary of preferred options

The preferred option for this SMZ is to ***Do Nothing.*** This option will involve working with nature as much as possible to maintain and enhance the landscape and environment, both along the coast and inside the Estuary. The Isle of Wight Council will not repair or maintain existing defences, and no new defences will be permitted where they are not already present

However, it is recognised that local erosion risks to businesses, people and coastal footpaths will need to be mitigated or adapted to, and therefore privately funded maintenance of existing assets will be permitted (subject to gaining the necessary consents).

Table 4-4: SMZ4 Preferred Options

	W18-W20
2015-2025	Do Nothing
2025-2055	Do Nothing
2055-2115	Do Nothing

4.5 SMZ 5 – Gurnard and Cowes Headland (ODU W21-W23)

4.5.1 Summary of preferred options

SMZ5a - Preferred option: Option 3 – Do Minimum and Resilience then Adapt

SMZ5a covers Option Development Units W21 and W22. The preferred option is to ***Do Minimum and Resilience then Adapt.*** This involves privately-funded community and property level flood resilience and adaptation at Gurnard Luck. Where possible, self-help measures to reduce potential flood ingress and damage should be implemented. Some properties in the area may be more suitable for flood 'resilience' measures (i.e. accepting that flood water will enter

the property and plan for that, e.g. raise the height of electrical installations) then 'resistance' measures (which are designed to prevent water entering the individual property, where this can be achieved).

Privately funded maintenance of existing coastal defences will also be permitted (subject to gaining the necessary consents). The Isle of Wight Council (IWC) will work with the community to develop and implement a Coastal Change Management Area plan, supported by the IWC planning process, which will clearly set out the strategy to respond and adapt to the risks, and to avoid inappropriate development in areas at risk.

Environment Agency (EA) operation of control structures at the mouth of Gurnard Luck stream is expected to continue whilst feasible. Sound flood response plans linked to the EA flood warning systems should continue to be developed and adopted by the community to reduce risk.

Along the cliffs between Gurnard Luck and Gurnard Bay there is very limited risk to properties (as they are set back from the cliff top, although the cliff top is expected to retreat back closer to the properties over time). The preferred option is to allow natural processes to continue (but ensure health and safety compliance (e.g. by limiting public access to areas considered at risk of failure).

SMZ5b - Preferred option: Option 3 – Maintain

SMZ5b covers policy unit W123. The preferred option is therefore to ***Maintain.*** This option requires a programme of maintenance and capital refurbishments of the sea wall defences to prevent erosion and re-activation of relict landslips. The defences are an integral aspect helping to maintain the stability of the coastal slopes in this area as they prevent wave action and coastal processes from eroding the base of the slopes.

Table 4-5: SMZ5 Preferred Options

	W21	W22	W23
2015-2025	Do Minimum, with community led adaption	Do Minimum (Maintain access and H&S)	Maintain
2025-2055	Do Minimum, with community led adaption	Do Minimum (Maintain access and H&S)	Maintain and refurbish / upgrade
2055-2115	Adaptation	Do Minimum (Maintain access and H&S)	Maintain and refurbish / upgrade

4.6 SMZ 6 – Cowes, East Cowes and Medina (ODU W24-W32)

4.6.1 Summary of preferred options

SMZ6a - Preferred option: Option 5 – Sustain (with Temporary Flood Barriers and PLP) then Improve from 2055

SMZ6a covers Option Development Units W24, W25 and W31. The preferred option is **to Sustain (with Temporary Flood Barriers and PLP) then Improve from 2055.** This will involve, in the short and medium term (up to 2055) using a combination of Temporary Flood Barriers and Property Level Protection to reduce the impacts of tidal flooding to the properties at most risk by sustaining a 1 in 75 year (1.33% AEP) standard of protection. Private ongoing maintenance and improvement of defence assets, particularly along the seafront, is also required and

encouraged. In the longer term (2055-2115) as the flood risk becomes greater the preferred option is to improve protection through raising or replacing existing frontline quay walls and constructing setback flood defences.

SMZ6b - Preferred option: Option 1 – Do Nothing

SMZ6b covers Option Development Units W26-28, W30 and W32. The preferred option is to ***Do Nothing.*** This option involves allowing natural processes to occur and for this part of the Medina frontage to evolve. It is however recognised that local erosion risks to businesses, people and coastal footpaths will need to be mitigated, or adapted to, and therefore privately funded maintenance of existing coastal infrastructure or defences will be permitted (subject to gaining the necessary consents).

At West Medina Mills (unit W27), no publically funded investment in coastal defences is planned, but privately funded defence improvements can be continued, in line with the SMP (2011) policy of 'hold the line' for this short, waterfront industrial unit.

Along East Cowes Outer Esplanade (from the Shrape Breakwater towards Old Castle Point, unit W32), there is currently a seawall in reasonable condition, and in this area the preferred approach is to continue minor maintenance to extend its residual life (where achievable; especially at the western end). However, there are no proposals to replace this seawall in the medium or long term (in line with the SMP policy change set in 2011), as there are not sufficient properties at risk to justify significant expenditure in this area.

SMZ6c - Preferred option: Option 3 – Maintain (and PLP) then Improve from 2055 (through redevelopment)

SMZ6c covers policy unit W29. The preferred option is ***Maintain (and PLP) then Improve from 2055 (through redevelopment).***

As part of the preferred option the quay walls will need to be maintained by the asset owners to maximise the residual life of these defences. It is recommended that commercial properties at significant risk implement and fund property level flood risk reduction and resilience measures. In addition, property level protection is recommended for a small number of residential properties. It is likely that these measures will need to be privately funded.

From 2055, as the flood risk increases, and defence structures reach the end of their service life, the preferred option is to refurbish and raise the existing quay walls. However, this is a costly option and significant non Grant in Aid funding will need to be secured. The Isle of Wight Council will continue to explore funding for this longer term option to reduce flood risk to people and property and to maintain the viability of the harbourside area. A key part of reducing the funding shortfall will be to gain contributions through redevelopment. Refurbishment and improvement of harbour walls and defences may be achievable sooner as redevelopment opportunities arise. Development within the flood zone or along the waterside will need to contribute not only to reducing site flood risk, but also towards the longer term strategic management of flood risk though improving defences or raising ground levels.

Table 4-6: SMZ6 Preferred Options

	W24	W25	W26	W27	W28	W29
2015-2025	PLP for residential properties at most risk and redevelopment	Temporary flood barriers and PLP for residential properties at most risk and redevelopment	Do Nothing	No publically funded defence improvements	Do Nothing	Maintain, minor PLP and redevelopment
2025-2055	PLP for residential properties at most risk and redevelopment	Temporary flood barriers and PLP for residential properties at most risk and redevelopment	Do Nothing	No publically funded defence improvements	Do Nothing	Maintain, minor PLP, refurbishment and redevelopment
2055-2115	Upgrade / new defences and redevelopment	Upgrade / new defences and redevelopment	Do Nothing	No publically funded defence improvements	Do Nothing	Maintain, minor PLP, refurbishment and redevelopment

	W30	W31	W32
2015-2025	Do Nothing	Temporary flood barriers and PLP for residential properties at most risk and redevelopment	Do Minimum
2025-2055	Do Nothing	Temporary flood barriers and PLP for residential properties at most risk and redevelopment	Do Minimum transferring to Do Nothing
2055-2115	Do Nothing	Upgrade / new defences and redevelopment	Do Nothing

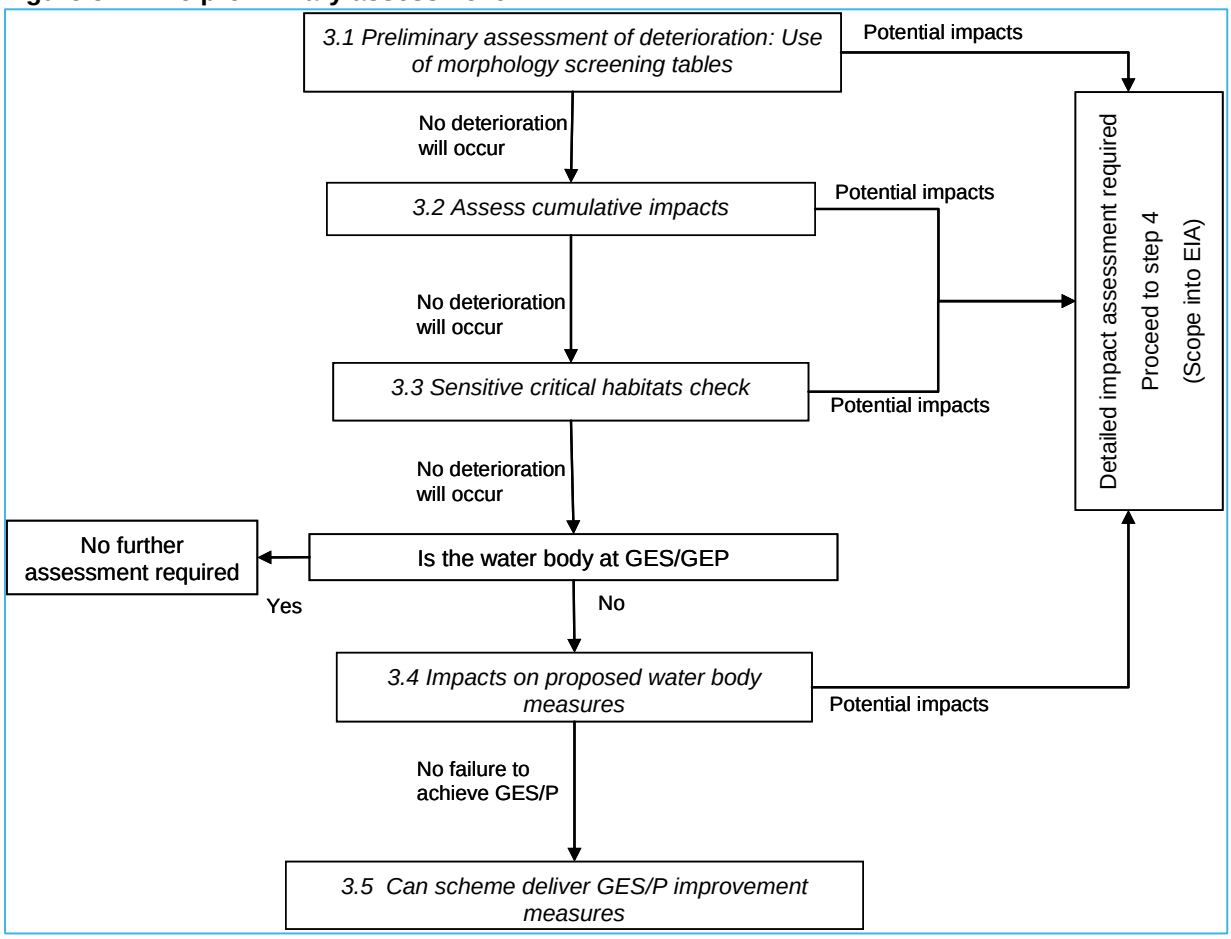
5. Preliminary Assessment

The aim of this stage is to assess the preferred options from the Strategy at a high level and determine which are unlikely to fail objectives under the WFD and do not need to be considered further, and which have the potential to cause a WFD objective failure and hence require detailed assessment. If, after the preliminary assessment, it is considered that a preferred option will not lead to deterioration across any of the WFD quality elements and that it will not prevent a waterbody from meeting its status or potential objectives, then no further WFD compliance assessment is required for that option.

The preliminary assessment is made up of the following step by step processes for each of the preferred Strategy options for each of the SMZs.

The preliminary assessment will also look at protected area impacts and a section on Shellfish and Bathing waters (where relevant) (Step 3.3 of the chart).

Figure 5-1: The preliminary assessment[19]



In terms of the preliminary assessment of deterioration, there are certain activities that are considered by the Environment Agency not to require assessment as they are unlikely to cause deterioration or result in a waterbody failing to achieve WFD status/potential objectives. These are listed in the Table 5-1 below.

[19] Assessing new modifications for compliance with WFD: detailed supplementary guidance, Environment Agency, 2010

Table 5-1: Activities not requiring WFD compliance assessment

Types of modification not requiring WFD assessment	
Maintenance activities	Re-pointing (block work structures)
	Void filling ('solid' structures)
	Re-positioning (rock or rubble or block work structures)
	Replacing elements (not whole structure)
	Re-facing
	Skimming/covering
	Blockage removal
	Removal of management of in-stream debris/rubbish from culverts and trash screens (not woody debris)
	Vermin control
Linear flood defences	Temporary flood defences

If the preferred options fall in to the above activities then they can be screened out of further WFD assessment.

When considered in isolation, if there are no impacts likely across any of the quality elements as a result of implementing a preferred solution, then it is necessary to move to the second step which involves a consideration of cumulative impacts within a waterbody. Whilst an individual scheme may have an insignificant impact on WFD quality elements within a reach, the combined effect of several small-scale schemes within a waterbody may cause deterioration.

The third step involves checking if the options are likely to affect habitats that are critical to the individual biological quality elements or on particularly sensitive habitats. If they are, then further assessment is required. It may also be necessary to carry out further assessment if any option is predicted to negatively impact on any salt marsh or seagrass habitat in transitional/coastal waters.

If it is determined that no deterioration of sensitive critical habitats will occur then waterbodies at Good Ecological Status (GES) or Good Ecological Potential (GEP) can be scoped out of any further assessment. If the waterbody is not of GEP then the fourth step is required. This involves considering if the Strategy will impact on proposed WFD improvement/mitigation measures thereby preventing failing waterbodies from reaching GES/GEP and hence resulting in a failure to meet the waterbody objectives (WFD Objective 2.

The morphology screening tables in the Environment Agency Guidance[2] do not apply to the coastal waterbodies such as Solent Coastal and Western Yar, as they are designed for fluvial systems, so expert judgement in relation to morphological elements is required to ascertain whether any quality elements will be affected by the scheme.

It should be noted that all impacts will be explored in greater detail at scheme level.

5.1 SMZ 1 – Needles Headland (ODU W1)

5.1.1 Waterbodies within SMZ

The Dorset / Hampshire coastal waterbody and the Solent coastal waterbody lie within SMZ1. There are no other waterbodies within the SMZ which could potentially be impacted as a result of the Strategy.

5.1.2 Preliminary assessment of deterioration

The preferred option for this SMZ (ODU W1) is to Do Nothing throughout the course of the Strategy. Only areas of privately owned defence would be permitted to carry out maintenance and in order to meet health and safety obligations relating to the eroding coastline.

The private maintenance, which is a continuation of the existing regime, is the 'replacement of elements' which is an activity excluded from the WFD compliance assessment (Table 5-1). As the areas of privately owned defence are small and isolated throughout the SMZ, only small areas of coastal squeeze and a resulting impact on habitat are likely, and will be less than 5% of the total waterbody affected. They are therefore screened out of any further assessment. The SMP WFD[13] acknowledged that there is overriding pubic interest and benefits to carry out maintenance to uphold health and safety.

Where maintenance work is proposed, there may be localised water quality impacts as a result of physical works, although it is anticipated that this will be minimal and can be further reduced with sensitive techniques and reference to the Environment Agency's Pollution Prevention Guidelines. In addition, works should be timed to avoid sensitive times such as bird breeding seasons. In any case, impacts resulting from physical works are unlikely to cause a permanent change in the ecological potential of the waterbody.

It is therefore considered that both WFD2[20] and WFD3[21] will be met by the implementation of the preferred option within SMZ1 when considered in isolation and it is necessary to move to the second step of the preliminary assessment.

5.1.3 Cumulative Impacts

As the activities associated with the preferred management options are considered to have no negative impact on WFD status of the coastal waterbody, there would also be no cumulative impact as a result of policy in this management zone in the first two epochs.

5.1.4 Sensitive Habitats

The SMZ lies within the South Wight Maritime SAC, the Needles Marine Conservation Zone and the draft Solent and Dorset Coast SPA.

The preferred option is in line with the SMP policy for this area which is for No Active Intervention. Natural coastal erosion is considered to be beneficial to the South Wight Maritime SAC and the process of erosion is not constrained by built development. No significant changes in sedimentation patterns are expected along this coastline affecting any designated sites as a result of the preferred option. Therefore the HRA screening[22] concluded there would be no likely significant effects to sensitive habitats.

The SMZ also lies within the Totland Shellfish waterbody. However, the preferred option will not result in any change from the present situation and therefore will not cause deterioration

[20] No changes that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential

[21] No changes which will permanently prevent or compromise the environmental objectives being met in other waterbodies

[22] Habitat Regulations Assessment (HRA) West Wight Coastal Flood and Erosion Risk Management Strategy – Screening Report (August 2015)

within the Totland Shellfish waterbody. Any proposed maintenance works would be timed to reduce the impact on Shellfish waters and can therefore be screened out from this SMZ.

5.1.5 Is the waterbody at GES/GEP?

The Dorset / Hampshire coastal waterbody is currently classified as having good potential, with the Solent waterbody currently classified as having moderate potential with an overall objective of reaching good potential by 2027. Therefore, the Solent waterbody moves to the fourth stage of the preliminary assessment for these waterbodies.

5.1.6 Impacts on proposed WFD improvement/mitigation measures

The Solent waterbody is classified as Heavily Modified, and the RBMP 2009 identifies mitigation measures that should be in place to achieve the best potential of the waterbody. Any scheme which prevents implementation of these measures could be preventing achievement of GEP.

The RBMP 2009 lists the following WFD measures for the Solent:

Mitigation Measure	Status
Indirect/offsite mitigation (offsetting measures)	Not In Place
Managed realignment of flood defence	Not In Place
Preserve and where possible enhance ecological value of marginal aquatic habitat, banks, and riparian zone	Not In Place
Manage disturbance	In Place
Site selection (dredged material disposal) (e.g. avoid sensitive sites)	In Place

The proposed strategy for SMZ1 will not prevent any of these mitigation measures and therefore should not prevent the waterbody meeting its target status of good ecological potential by 2027.

5.1.7 Can the scheme deliver GES/GEP improvement or mitigation measures

The proposed strategy for SMZ1 is to allow natural process to continue, with only privately owned structures maintained. In addition, much of the frontage is characterised by undefended high cliffs so this approach should help work towards enhancing the ecological value of the marginal habitat and banks as there will be no coastal squeeze as a result of a rise in sea level.

5.2 SMZ 2 – Totland and Colwell Bays (ODU W2-W7)

5.2.1 Waterbodies within SMZ

The Solent coastal waterbody lies within SMZ2. There are no other waterbodies within the SMZ which could potentially be impacted as a result of the Strategy.

5.2.2 Preliminary assessment of deterioration

The preferred option for this SMZ (ODU W2-W7) is to Do Minimum, so that coastal access is maintained for as long as possible and ensuring health and safety obligations are met. Over time the SoP will fall due to sea level rise, causing an increase in flood risk from wave overtopping. Although there are sections of defence within this SMZ which have already failed (in particularly at ODU W4), no reinstatement of the defence across the Strategy period is currently fundable. In ODU W7, the preferred option is to Do Nothing throughout the duration of the Strategy.

In the medium to long term a coastal change management area plan across the SMZ will be developed to ensure that planning policy supports adaptation along this stretch of coastline.

It is therefore considered that both WFD2[23] and WFD3[24] will be met by the proposed scheme and it is necessary to move to the second step of the preliminary assessment.

5.2.3 Cumulative Impacts

As the activities associated with the preferred management options are considered to have no negative impact on WFD status of the coastal waterbody, there would also be no cumulative impact as a result of policy in this management zone in the first two epochs.

5.2.4 Sensitive Habitats

The proposed Solent and Dorset Coast SPA may fall within this SMZ, but will be designated for offshore feeding grounds for tern species. There would be no significant effect as a result of the proposed works.

The preferred option is in line with the SMP policy for this area which is for HTL and NAI. The Do Minimum approach will allow the advancement of the seaward area due to cliff erosion. The SMP WFDa[13] identified that some BQEs could be impacted within this area as a result of sea level rise submerging intertidal reefs, leading to some degree of loss of habitat. However, as a result of the proposed habitat creation at Thorley Brook, compensatory habitat will be created.

Natural coastal erosion will continue to benefit the habitats within the area and there are will be no significant effects. The HRA screening[25] concluded there would be no likely significant effects to sensitive habitats.

SMZ2 does not lie within any Shellfish waterbodies, and can therefore be screened out from this SMZ.

5.2.5 Is the waterbody at GES/GEP?

The Solent waterbody is currently classified as having moderate potential with an overall objective of reaching good potential by 2027. Therefore, it is necessary to move to the fourth stage of the preliminary assessment for this waterbody.

5.2.6 Impacts on proposed WFD improvement/mitigation measures

The Solent waterbody is classified as Heavily Modified, and therefore the 2009 RBMP identifies mitigation measures that should be in place to achieve the best potential of the waterbody. Any scheme which prevents implementation of these measures could be preventing achievement of GEP

The 2009 RBMP lists the following measures for the Solent.

Mitigation Measure	Status
Indirect/offsite mitigation (offsetting measures)	Not In Place
Managed realignment of flood defence	Not In Place
Preserve and where possible enhance ecological value of marginal aquatic habitat, banks, and riparian zone	Not In Place

[23] No changes that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential

[24] No changes which will permanently prevent or compromise the environmental objectives being met in other waterbodies

[25] Habitat Regulations Assessment (HRA) West Wight Coastal Flood and Erosion Risk Management Strategy – Screening Report (August 2015)

Mitigation Measure	Status
Manage disturbance	In Place
Site selection (dredged material disposal) (e.g. avoid sensitive sites)	In Place

The preferred option within SMZ2 would be incorporating the proposed action of "preserving and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone" that is set out within the 2009 RBMP. The proposed strategy will also not prevent the waterbody meeting its target status of good ecological potential by 2027.

5.2.7 Can the scheme deliver GES/GEP improvement or mitigation measures

The proposed strategy for SMZ2 is to Do Minimum, maintaining defences maintained for as long as possible and ensuring health and safety obligations, with privately owned defences maintained. This approach should help work towards enhancing the ecological value of the marginal habitat and banks as there will be no coastal squeeze as a result of a rise in sea level.

5.3 SMZ 3 – Yarmouth Area (ODU W8-W17)

5.3.1 Waterbodies within SMZ

The Solent coastal, the Dorset/Hampshire coastal and the Western Yar transitional waterbodies all lie within SMZ3.

The Solent waterbody lies adjacent to ODU W8, W9, W16 and W17, whilst the Western Yar lies adjacent to ODU W10, W11 and W13-W15. The Dorset/Hampshire coastal waterbody lies adjacent to ODU W12.

5.3.2 Preliminary assessment of deterioration

5.3.2.1 SMZ 3a – Yarmouth Area (ODU W8, W9, W15-W17)

The preferred option for ODU W8 is to Do Minimum / Health & safety compliance throughout the course of the Strategy. Any areas of privately owned defence, in particularly at Fort Victoria, would be permitted to carry out maintenance in order to meet health and safety obligations relating to the eroding coastline. Over time, the SoP will fall due to sea level rise, but the main risk in this area is erosion, not flooding, with a limited number of properties at risk.

The preferred option ODU W9 in the short to medium term is to maintain the existing assets. The breakwater at Yarmouth (W9) will continue to be maintained and refurbished by the Harbour Authority if funding is available. However, over time the SoP will fall due to sea level rise, causing an increase in flood risk and therefore in the longer term (2055) the breakwater and defences will need to be replaced and raised to address the increased risk.

The preferred option for ODU W15 and W16 in the short and medium term is to manage and reduce the flood risk to properties through the use of temporary flood barriers. In the longer term (2055) the existing defences will need to be upgraded or new setback defences built to manage the increased flood and erosion risk.

The preferred option for ODU W17 is for reactive maintenance of the defence in the short term, followed by refurbishment of the existing defence and then in the longer term scheduled maintenance.

5.3.2.2 SMZ 3b – Western Yar Valley (ODU W10, W13, W14)

The preferred option for ODU W10 and W13 is to Maintain access and H&S compliance throughout the course of the Strategy. Any areas of existing privately owned defence would be

permitted to carry out maintenance and meet health and safety obligations. Over time, the SoP will fall due to sea level rise, causing an increase in flood risk but there are only isolated properties in this area.

The preferred option at ODU 14 in the medium and long term is for the managed realignment and intertidal habitat creation at Thorley Brook, which could deliver compensatory grazing marsh through the Environment Agency's Southern Regional Habitat Creation Programme (RHCP) and the provision of compensatory high tide bird roosting sites. The Environment Agency will seek funding for the delivery of the compensatory habitat. Over time Thorley Brook will evolve and be allowed to function naturally.

The creation of the intertidal habitat may significantly change the Thorley Brook waterbody and increase the saline content of the water, as the waterbody is currently brackish. However, the creation of the maritime habitat will help offset any potential habitat losses as a result holding the line in other areas of the Strategy area and also within the wider waterbody area. As a result of the water quality changes, this option requires a more detailed assessment as it is possible that Objective WFD2 will not be met.

5.3.2.3 SMZ 3c – Freshwater (ODU W11, W12)

At ODU W11 in the long term a setback flood risk reduction scheme preceded by maintenance and property level resilience at Freshwater village are proposed to reduce the flood risk. The preferred option also includes opportunities for intertidal habitat creation close to Freshwater village to help deliver environmental mitigation elsewhere. The creation of any new habitat could potentially contribute to RHCP objectives, providing new areas of coastal grazing marsh, if the habitat would be of a suitable type, in a suitable location, of suitable extent and of sufficient quality to fit relevant criteria.

The preferred option for ODU W12 in the short and medium term is to maintain and refurbish the existing seawall.

5.3.2.4 Summary

Where maintenance/upgrading work is proposed at ODU W9, W11, W12 and W15-W17, there may be localised water quality impacts as a result of physical works, although it is anticipated that this will be minimal and can be further reduced with sensitive techniques and reference to the Environment Agency's Pollution Prevention Guidelines. In addition, works should be timed to avoid sensitive times such as bird breeding and overwintering bird seasons.

In any case, impacts resulting from physical works are unlikely to cause a permanent change in the ecological potential of the waterbody as it is the 'replacement of elements', which is an activity excluded from the WFD compliance assessment (Table 5-1). It is therefore considered that both WFD2[20] and WFD3[21] will be met by the proposed scheme and it is necessary to move to the second step of the preliminary assessment (as per Figure 5-1).

5.3.3 Cumulative Impacts

In combination impacts with other SMZs are likely to be limited, however, to avoid any impacts; development of scheme-specific methodologies should be established to avoid any works causing changes to water quality or disturbance of bird species for which the Solent and Southampton Water SPA and Ramsar and the Solent Maritime SAC are designated.

Additionally as the activities associated with the preferred management options are considered to have no negative impact on WFD status of the coastal waterbody, there would also be no cumulative impact as a result of policy in this management zone in the first two epochs.

5.3.4 Sensitive Habitats

The maintenance/upgrading/refurbishment of the defences at ODU W9, W11, W12, and W15-W17 will be undertaken within the existing footprint (or setback from the coastline); however, they all lie adjacent to the Solent and Southampton Water SPA/Ramsar site, and the Solent Maritime SAC. The preferred option could therefore result in coastal squeeze on these designated sites as a result of this approach. This was anticipated at the SMP level.

The breakwater at Yarmouth (ODU W9) lies adjacent to the seagrass beds which lie within the Solent Maritime SAC. Any works carried out on the breakwater will need to have consideration of the adjacent seagrass habitat. Options for upgrading the breakwater are being developed by the Harbour Commissioners.

The proposed Solent and Dorset Coast SPA may include this section of coastline but will be designated for offshore feeding grounds for tern species. There would be no significant effect as a result of the proposed works.

As a result of the habitat creation (ODU W14) within the designated Solent to Southampton Water SPA and Ramsar, this option requires a more detailed assessment as it is possible that Objective WFD2 will not be met. This was anticipated at the SMP level.

The SMZ also lies within the Yarmouth Shellfish waterbody. However, the preferred option will not cause any change in the water quality from the present situation and therefore will not cause deterioration within the Yarmouth Shellfish waterbody. Any proposed maintenance works would be timed to reduce the impact on Shellfish waters and can therefore be screened out from this SMZ.

It is considered that Environmental Objective WFD3 would be met; however, the preferred option for maintaining the defences and habitat creation require more detailed assessment as it is possible that Objective WFD2 will not be met for both the waterbodies. This is because maintaining the existing defences may lead to beach narrowing and steepening, and the habitat creation could adversely impact the SPA and Ramsar habitat through saline intrusion, with a consequent impact on benthic habitats of all the waterbodies found within this SMZ. Although there will be no increase in defence footprint, this preferred option requires further assessment and is taken forward to the detailed impact assessment stage.

5.4 SMZ 4 – Newtown Coast (ODU W18-W20)

5.4.1 Waterbodies within SMZ

The Solent coastal waterbody and the Newtown River transitional waterbody lie within SMZ4.

5.4.2 Preliminary assessment of deterioration

The preferred option for this SMZ (ODU W18-W20) is to Do Nothing throughout the course of the Strategy. Only existing areas of privately owned defence would be permitted to carry out maintenance to meet health and safety obligations relating to the eroding coastline. The coast and estuary shorelines are undefended.

The private maintenance, which is a continuation of the existing regime, is the 'replacement of elements' which is an activity excluded from the WFD compliance assessment (Table 5-1). As the areas of privately owned defence are small and isolated throughout the SMZ, only small areas of coastal squeeze and a resulting impact on habitat are likely, and will be less than 5% of the total waterbody affected. They are therefore screened out of any further assessment. The SMP WFD[13] acknowledged that there is overriding pubic interest and benefits to carry out maintenance to uphold health and safety.

Where maintenance work is proposed, there may be localised water quality impacts as a result of physical works, although it is anticipated that this will be minimal and can be further reduced with sensitive techniques and reference to the Environment Agency's Pollution Prevention Guidelines. In addition, works should be timed to avoid sensitive times such as bird breeding seasons. In any case, impacts resulting from physical works are unlikely to cause a permanent change in the ecological potential of the waterbody.

It is therefore considered that both WFD2[26] and WFD3[27] will be met by the implementation of the preferred option within SMZ1 when considered in isolation and it is necessary to move to the second step of the preliminary assessment.

5.4.3 Cumulative Impacts

In combination impacts with other SMZs are likely to be limited, however, to avoid any impacts; development of scheme-specific methodologies should be established to avoid any works causing changes to water quality or disturbance of bird species for which the Solent and Southampton Water SPA and Ramsar and the Solent Maritime SAC are designated.

Additionally as the activities associated with the preferred management options are considered to have no negative impact on WFD status of the coastal waterbody, there would also be no cumulative impact as a result of policy in this management zone in the first two epochs.

5.4.4 Sensitive Habitats

The SMZ lies within the Solent Maritime SAC, as well as sections of the Solent and Southampton Water SPA/ Ramsar. The preferred option forms a NAI policy which helps avoid habitat losses through coastal squeeze. Therefore there will be no impact on the SAC, SPA and Ramsar site.

The SMZ also lies within the Newtown and Cowes Shellfish waterbodies. However, the preferred option will not cause any change in the water quality from the present situation and therefore will not cause deterioration within the Newtown and Cowes Shellfish waterbody. Any proposed works would be timed to reduce the impact on Shellfish waters and can therefore be screened out from this SMZ.

5.4.5 Is the waterbody at GES/GEP?

The Newtown River and the Solent waterbodies are currently classified as having moderate potential with an overall objective of reaching good potential by 2027. Therefore, it is necessary to move to the fourth stage of the preliminary assessment for these waterbodies.

5.4.6 Impacts on proposed WFD improvement/mitigation measures

The Solent waterbody is classified as Heavily Modified, and therefore the 2009 RBMP identifies mitigation measures that should be in place to achieve the best potential of the waterbody. Any scheme which prevents implementation of these measures could be preventing achievement of GEP.

The 2009 RBMP lists the following measures for the Solent.

Mitigation Measure	Status
Indirect/offsite mitigation (offsetting measures)	Not In Place
Managed realignment of flood defence	Not In Place

[26] No changes that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential

[27] No changes which will permanently prevent or compromise the environmental objectives being met in other waterbodies

Mitigation Measure	Status
Preserve and where possible enhance ecological value of marginal aquatic habitat, banks, and riparian zone	Not In Place
Manage disturbance	In Place
Site selection (dredged material disposal) (e.g. avoid sensitive sites)	In Place

The preferred option within SMZ2 would be incorporating the proposed action of "preserving and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone" that is set out within the 2009 RBMP. The proposed strategy will also not prevent the waterbody meeting its target status of good ecological potential by 2027.

5.4.7 Can the scheme deliver GES/GEP improvement or mitigation measures

The proposed strategy for SMZ4 is to allow natural process to continue, with privately owned defences maintained. This approach should help work towards enhancing the ecological value of the marginal habitat and banks as there will be no coastal squeeze as a result of a rise in sea level.

5.5 SMZ 5 – Gurnard and Cowes Headland (ODU W21-W23)

5.5.1 Waterbodies within SMZ

The Solent coastal, waterbody lies within SMZ5.

5.5.2 Preliminary assessment of deterioration

5.5.2.1 SMZ 5a – Gurnard Luck and Gurnard cliff (ODU W21, W22)

The preferred option for ODU W21 in the short term to medium term is to Do Minimum and Adapt. This involves privately-funded community and property level flood resilience and adaptation at Gurnard Luck. Where possible, self-help measures to reduce potential flood ingress and damage should be implemented. Privately funded maintenance of existing coastal defences will also be permitted (subject to gaining the necessary consents).

The Isle of Wight Council (IWC) will work with the community to develop and implement a Coastal Change Management Area plan, supported by the IWC planning process, which will clearly set out the strategy to respond and adapt to the risks, and to avoid inappropriate development in areas at risk. Environment Agency (EA) operation of control structures at the mouth of Gurnard Luck stream is expected to continue whilst feasible. Sound flood response plans linked to the EA flood warning systems should continue to be developed and adopted by the community to reduce risk.

The short and medium term option will not cause any change or deterioration to WFD objectives and does not require further consideration. In the longer term (2055) the preferred option is for Adaptation and to allow natural processes to continue. A Coastal Change Management Area will be developed to ensure planning policy supports adaptation. The preferred option for ODU W22 across the course of the Strategy period is to Do Minimum (ensure health & safety compliance) and allow natural processes to continue.

No work would be required to be undertaken at ODU W21 and ODU W22, and will therefore not cause any change or deterioration to WFD objectives. If private maintenance takes place it will be a continuation of the existing regime and can be screened out from detailed assessment as it is the 'replacement of elements' which is an activity excluded from the WFD compliance assessment (Table 5-1).

Should funding be sourced and a small scheme be progressed at Gurnard Luck (see Appendix J), scheme level assessments will need to ensure the WFD requirements are assessed and any adverse impacts are mitigated or compensated through the delivery of the scheme. Enhancement opportunities should also be sought in such an instance.

5.5.2.2 SMZ 5b – Gurnard to Cowes Parade

The preferred option for ODU W23 in the short to medium term is to undertake maintenance. In the longer term (2055) the flood wall will require improvement and or replacement. The improvement works or replacement defence structure (to be determined in future studies) will be constructed within the existing footprint of the defence or landwards and will not impact the habitat in the area surrounding the defence.

5.5.2.3 Summary

Where maintenance work is proposed on private defences, there may be localised water quality impacts as a result of physical works, although it is anticipated that this will be minimal and can be further reduced with sensitive techniques and reference to the Environment Agency's Pollution Prevention Guidelines. In addition, works should be timed to avoid sensitive times such as bird breeding seasons. In any case, impacts resulting from physical works are unlikely to cause a permanent change in the ecological potential of the waterbody.

In any case, impacts resulting from physical works are unlikely to cause a permanent change in the ecological potential of the waterbody as it is the 'replacement of elements', which is an activity excluded from the WFD compliance assessment (Table 5-1). It is therefore considered that both WFD2[20] and WFD3[21] will be met by the proposed scheme and it is necessary to move to the second step of the preliminary assessment (as per Figure 5-1).

5.5.3 Cumulative Impacts

In combination impacts with other SMZs are likely to be limited, however, to avoid any impacts; development of scheme-specific methodologies should be established to avoid any works causing changes to water quality or disturbance of bird species for which the Solent Maritime SAC are designated.

Additionally as the activities associated with the preferred management options are considered to have no negative impact on WFD status of the coastal waterbody, there would also be no cumulative impact as a result of policy in this management zone in the first two epochs.

5.5.4 Sensitive Habitats

The defence maintenance works at ODU W23 will be undertaken within the existing defence footprint; however, it lies adjacent to the Solent Maritime SAC. The preferred option could result in coastal squeeze on the SAC, as a result of this approach.

The SMZ also lies within the Cowes Shellfish waterbody. However, the preferred option will not cause any change in the water quality from the present situation and therefore will not cause deterioration within the Cowes Shellfish waterbody. Any proposed maintenance works would be timed to reduce the impact on Shellfish waters and can therefore be screened out from this SMZ.

It is considered that Environmental Objective WFD3 would be met; however, the preferred option for maintaining the defence requires more detailed assessment as it is possible that Objective WFD2 will not be met. This is because maintaining the existing defences may lead to beach narrowing and steepening, with a consequent impact on benthic habitats of the Solent coastal water body. Although there will be no increase in defence footprint, this preferred option at ODU W23 requires further assessment and is taken forward to the detailed impact assessment stage.

5.6 SMZ 6 – Cowes, East Cowes and Medina (ODU W24-W32)

5.6.1 Waterbodies within SMZ

The Solent coastal and the Medina transitional waterbodies all lie within SMZ6.

The Solent waterbody lies adjacent to ODU W24 and W32, whilst the Medina lies adjacent to ODU W25-W31.

5.6.2 Preliminary assessment of deterioration

5.6.2.1 SMZ 6a – Cowes and East Cowes (ODU W24, W25, W31)

The preferred option for ODU W24, W25 and W31 is to provide temporary flood barriers and property level protection in the short and medium term. In the longer term the existing defences will be replaced and raised to improve the SoP, as this would otherwise fall due to sea level rise, causing an increase in flood risk.

5.6.2.2 SMZ 6b – Medina Estuary and East Cowes Outer Esplanade (ODU W 26-W28, W30, W32)

The preferred option for ODU W26, W28, W30 and W32 is to Do Nothing throughout the course of the Strategy (with the exception of epoch one in W32 where the preferred option is initially Do Minimum). Over time the SoP will fall due to sea level rise, causing an increase in flood risk but there are only isolated properties at risk on this largely undeveloped coastline.

The preferred option for W27 throughout the course of the Strategy is Do Nothing at public expense, however areas of privately owned defence can be maintained and improved as part of the planning process.

5.6.2.3 SMZ 6c – Newport Harbour (ODU W29)

The preferred option for ODU W29 is to maintain and refurbish the existing defences, with localised PLP and flood resilience recommended in the short to medium term, and then to improve through redevelopment in the longer term (2055).

5.6.2.4 Summary

Where maintenance work is proposed on private defences, there may be localised water quality impacts as a result of upgrade works, although it is anticipated that this will be minimal and can be further reduced with sensitive techniques and reference to the Environment Agency's Pollution Prevention Guidelines. In addition, works should be timed to avoid sensitive times such as bird breeding seasons. In any case, impacts resulting from physical works are unlikely to cause a permanent change in the ecological potential of the waterbody.

In any case, impacts resulting from physical works are unlikely to cause a permanent change in the ecological potential of the waterbody as it is the 'replacement of elements', which is an activity excluded from the WFD compliance assessment (Table 5-1). It is therefore considered that both WFD2[20] and WFD3[21] will be met by the proposed scheme and it is necessary to move to the second step of the preliminary assessment (as per Figure 5-1).

It should also be noted that planned development at Medina Yard (W25) and East Cowes (W32) is likely to require improvement works to the defences. Subsequently, individual WFD assessments would need to be undertaken for these sites to assess the impact of upgrading the defences at these locations.

5.6.3 Cumulative Impacts

In combination impacts with other SMZs are likely to be limited, however, to avoid any impacts; development of scheme-specific methodologies should be established to avoid any works

causing changes to water quality or disturbance of bird species for which the Solent Maritime SAC are designated.

Additionally as the activities associated with the preferred management options are considered to have no negative impact on WFD status of the coastal waterbody, there would also be no cumulative impact as a result of policy in this management zone in the first two epochs.

5.6.4 Sensitive Habitats

The maintenance/future upgrades of the defences at ODU W24, W25, W31 and W29 will be undertaken within the existing footprint of the defences; however, they lie adjacent to the Solent Maritime SAC, with an area of ODU W29 within the Solent Maritime SAC and Solent and Southampton Water SPA/ Ramsar at its northern end. The preferred option could result in coastal squeeze on the SAC, SPA and Ramsar, as a result of this approach.

The SMZ also lies within the Cowes Shellfish waterbody. However, the preferred option will not cause any change in the water quality from the present situation and therefore will not cause deterioration within the Cowes Shellfish waterbody. Any proposed maintenance works would be timed to reduce the impact on Shellfish waters and can therefore be screened out from this SMZ.

It is considered that Environmental Objective WFD3 would be met; however, the preferred option for maintaining the defence requires more detailed assessment as it is possible that Objective WFD2 will not be met. This is because maintaining the existing defences may lead to beach narrowing and steepening, with a consequent impact on benthic habitats of the Solent coastal water body. Although there will be no increase in defence footprint, further assessment is required and is taken forward to the detailed impact assessment stage.

5.7 Summary of Preliminary Assessment

Table 5-2 below shows the outcome of the preliminary assessment, in terms of whether WFD environmental objectives may not be met and hence where detailed assessment is required

Table 5-2: Strategic Management Zones (ODUs) Preliminary Assessment Summary

Strategic Management Zone	ODUs	Reason for detailed assessment
1	-	-
2	-	-
3	W9, W11, W12, W14, W15-W17	Possible failure to meet WFD2 (and WFD3 for W14)
4	-	-
5	W23	Possible failure to meet WFD2
6	W24, W25, W31, W29	Possible failure to meet WFD2

6. Option Appraisal and Selection of Preferred Option

During the option appraisal stages, the WFD objectives set out in Table 1-4 should be considered. If any of the preferred options in this Strategy are likely to cause deterioration, then suitable mitigation or alternative options should be considered. If impacts are still unavoidable and the Strategy is still likely to cause deterioration or prevent a waterbody from meeting its WFD objectives then it is necessary to consider the Article 4.7 condition which asks whether there are any significantly better environmental options.

The preferred options for each Strategic Management Zone and their reasons for selection are outlined in Section 4 of this report. All potential Strategy options have been considered during the development of these preferred options. A number of assessments have been carried out to formulate and evaluate options for maintenance and improvement of defences, based on careful consideration of all technical issues, economics, stakeholder interests, future developments and environmental impacts. The preferred options therefore represent the lowest impact, most economic and above all most sustainable of the assessed options. It should be noted that all impacts will need to be explored in greater detail at scheme level.

7. Detailed Impact Assessment

The options which have reached this stage of the assessment, have either been identified as potentially causing deterioration in WFD status/potential or preventing a waterbody from meeting its future ecological objectives.

The preferred Strategy options for the management units as set out in Table 5-2 either do not meet objective WFD2[28] on their own, or have the potential to cause a failure of WFD2 when considered in combination with other ODUs within the Strategy area.

Appendix D provides a summary of the ODUs and the conclusion of the preliminary and detailed impact assessment.

7.1 Will the strategy cause deterioration or prevent the achievement of GEP

In order to protect the residential and commercial properties and critical infrastructure within the ODUs highlighted, maintenance and upgrading or improving the defence is essential. The defences proposed would replace the existing defence which is of varying type, condition and standard.

Although in SMZ 1 and 4, maintenance of defences to uphold health and safety requirements has been screened out, the continued maintenance of a defence in the other SMZs could reduce morphological and ecological diversity. Beach narrowing and steepening and an overall reduction in the non-designated intertidal area may result from increased tide heights resulting from climate change.

For all ODUs, there may be localised water quality impacts as a result of construction works, although it is anticipated that this will be minimal and can be further reduced with sensitive construction techniques and reference to the Environment Agency's Pollution Prevention Guidelines. In addition, works should be timed to avoid sensitive times such as bird breeding seasons. In any case, impacts resulting from construction are unlikely to cause a permanent change in the ecological potential of the waterbody. Construction can also be carried out to avoid sensitive periods and construction methods adopted to avoid the uncontrolled release of sediments and contamination, for example silt curtains.

The SMP WFD[13] acknowledged that the policy of maintaining the defences is required to preserve residential property and infrastructure and that there are overriding Public interest and benefits.

WFD compliance will still need to be reviewed at scheme level to confirm that no deterioration occurs within the waterbody.

7.1.1 Sensitive habitats

The HRA[22] acknowledges that although there are some cases where the defences will be maintained, overall coastal squeeze will be very limited as there are opportunities for seaward habitats to migrate landward elsewhere. Despite sea level rise, there would be opportunities for the designated features of the SAC and SPA/ Ramsar to migrate landward. Furthermore the managed realignment at Thorley Brook is designed to compensate for the effects of loss of intertidal habitat elsewhere through coastal squeeze.

[28] No changes that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential

7.1.1.1 SMZ3

The SMP HRA[29] notes that for SMZ3a "*the defences along Norton Spit are to be held for the duration of the SMP, which will ensure that the mudflat and saltmarsh on the landward side of the spit are maintained, resulting in a beneficial effect of the HTL policy. Furthermore, allowing the adjacent coastline between Sconce Point and Norton to naturally erode in the medium to long term will ensure an increase of sediment downdrift, resulting in accretion of Norton Spit which would further protect the mudflat and saltmarsh on the landward side of the defence structures.*" The defences fronting Bouldnor Road to the east of the mouth of the Yar Estuary will continue to protect coastal grazing marsh from saline intrusion. Therefore there is no likely significant effect on the European sites. Therefore there is no likely significant effect on the European sites.

The HRA of the SMP concluded that managed realignment at Thorley Brook (ODU W14) would lead to an adverse effect on Solent to Southampton Water SPA and Ramsar through saline intrusion and loss of coastal grazing marsh habitat. 31ha of coastal grazing marsh would be lost. It was determined by Imperative Reasons of Overriding Public Interest (IROPI) that compensation for this loss of habitat would be achieved through delivery via the Southern Region RHCP. Without such compensatory habitat provision the Strategy would lead to a likely significant adverse effect on the SPA/ Ramsar in line with the conclusion of the HRA of the SMP. A significant effect may be considered to arise from 2025 but as an IROPI for the SMP has already been undertaken and it has been agreed that compensatory habitat provision will need to be delivered by RHCP before the Strategy managed realignment policy can be implemented. It will be the responsibility of the scheme developers to confirm that this has occurred.

Compensatory habitat will comprise grazing marsh including provision of suitable habitat that would provide compensatory high tide roosts sites

Although a conclusion of LSE on Solent and Southampton Water SPA/ Ramsar has been reached, further Appropriate Assessment is not required since the Strategy is in line with agreed IROPI of the SMP and specific measures should be addressed within project-level HRAs.

The HRA[22] for this Strategy also notes that for SMZ3a within the SMP calculations predict a loss of 0.4ha of saltmarsh and mudflat from the Solent Maritime SAC and 0.25ha of such habitats from the Solent and Southampton Water SPA/ Ramsar as a result of coastal squeeze. This is not considered to be a significant amount of habitat loss within the SMP HRA since the level of loss is within the natural fluctuations of the ecosystem and indiscernible from natural losses.

7.1.1.2 SMZ5

The HRA of the SMP notes that within SMZ5 "*there is the potential for loss of some of the silt, gravel, and boulder littered foreshore along the Gurnard frontage… however, the interest features for the Solent Maritime SAC are the subtidal mudflats and sandflats, and maintaining the defences will not affect the integrity of the three International sites*."

The HRA for this Strategy concludes that although there are implications on other SAC designated habitats (e.g. Spartina swards and Atlantic salt meadows) they are absent from this SMZ. Therefore, any coastal squeeze in this SMZ will restrict intertidal and terrestrial habitats only and not subtidal features.

7.1.1.3 SMZ6

The HRA for this Strategy notes that the Solent Maritime SAC within SMZ6 extends only to mean low water, so even though the Medina transitional waterbody is constrained in places by

[29] Isle of Wight Shoreline Management Plan 2, Habitat Regulations Assessment (December 2010), Royal Haskoning

hard defences and sea level rise will lead to a loss of intertidal habitat, the extent of subtidal habitat will not be reduced as a result.

The HRA of the IW SMP noted that although up to 1.7ha of mudflat may be lost from the Solent Maritime SAC along the Medina Valley, overall the SAC will experience a much greater increase in mudflat habitat (142ha through the implementation of the North Solent SMP) and therefore no significant effect would occur. Bird species for which Solent and Southampton Water SPA is designated would not be adversely affected since habitat changes would be extremely incremental compared to short term fluctuations in habitat availability (tidal effects).

7.1.2 Conclusion

It is therefore considered that in the context of the wider Solent, Western Yar, Medina and Dorset/Hampshire waterbodies, potential impacts of the Strategy options on ecological elements will be localised and they are unlikely to prevent the deterioration and the achievement GEP within the waterbodies as a whole.

7.2 Impacts on other waterbodies

This assessment has included all landward waterbodies that have the potential to be impacted by the preferred Strategy options and the adjacent coastal waterbodies. In conclusion, no other waterbodies will be affected by the preferred Strategy options.

7.3 In-combination effects

There are no other approved coastal strategies covering the full Strategy area and therefore there are no in-combination effects which can be identified.

It is noted that works within the Strategy waterbodies and overlapping SPA/Ramsar/SAC sites should be timed so that they don't occur at the same time and at sensitive periods, to avoid significant disturbance, which will reduce any in-combination disturbance effects that could arise. Therefore, no additional mitigation needs to be considered.

7.4 Other European legislation

WFD article 4.8 requires any new scheme to be consistent with other European environmental legislation. As discussed above in sections, there are designated Shellfish Waters within the Strategy area.

There is the possibility that contamination present in the soils along the strategy frontage could be released by construction works required to maintain and upgrade coastal defences. Surface water run-off from construction sites can contain elevated levels of silt and suspended solids, caused by rainwater running off exposed soils and bare earth. If the soils exposed by the works are contaminated, there is the potential for the run-off to pick up these contaminants, leading to pollution from for example hydrocarbons, metals or organic compounds.

In order to prevent this, appropriate construction methods and pollution techniques would be employed in accordance with the relevant Pollution Prevention Guidelines issued by the Environment Agency. It is not possible to assess these impact sources as part of a strategic WFD assessment. Environmental Impact Assessment will be carried out for individual schemes (Project Appraisal Reports) to ensure no adverse effects on Shellfish Water and Bathing Waters and how this would be reduced to an acceptable level as a result of construction work. It is therefore concluded that, at the Strategic scale of assessment, there would be no impact on the designated Shellfish Waters from the Strategy.

Appendix A

Condition of Designated Areas that could be affected by the Strategy

Site	Condition/Status	Reason for Designation
The Solent Maritime SAC	Designated	The Solent Maritime SAC extends along the north and north-west coastline of the Isle of Wight and covers the majority of the intertidal area along the western Solent, west side of Southampton Water and the Hamble. The site is designated under the EU Habitats Directive for its Annex I habitats which include: • Salicornia and other annuals colonising mud and sand • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) • Spartina swards (Spartinion maritimae) • Mudflats and sandflats - not submerged at low tide • Annual vegetation drift lines • Perennial vegetation of stony banks • Coastal lagoons • Shifting white dunes with Ammophila arenaria • Estuaries • Sandbanks - slightly covered by sea water all the time The conservation objectives of the Solent Maritime SAC are to maintain in favourable condition, subject to natural change the Annex 1 habitats for which the site has been designated as listed above. The site covers a complex of estuarine systems with a wide range of estuary types and diversity of habitats. The estuary habitats support a wide variety of communities which depend on the ecological functioning of other communities, therefore loss of habitats/communities would be detrimental to the favourable condition of the estuaries feature. The key sensitivity is the loss or reduction in the Annex I habitats. Annual vegetated drift lines are sensitive to physical loss as a result of coastal squeeze and changes in coastal processes may affect the sediment budget of estuaries and reduce the supply of sediment to areas of drift line vegetation. Saltmarsh (*Salicornia*, Atlantic salt meadows and *Spartina* swards), mudflats and sandflats are sensitive to physical loss through coastal squeeze due to sea level rise.

Site	Condition/Status	Reason for Designation
		The site is also designated for the Annex II species Desmoulin's whorl snail (*Vertigo moulinsiana*). Desmoulin's whorl snail is the largest *Vertigo* species, with a shell height up to about 2.6 mm. It normally lives on reed-grasses and sedges, such as reed sweet-grass.
South Wight Maritime SAC	Designated	The southern shore of the Isle of Wight, off the coast of southern England, includes a number of subtidal reefs that extend into the intertidal zone. This site is selected on account of its variety of reef types and associated communities, including chalk, limestone and sandstone reefs. South Wight Maritime on the south coast of England also represents contrasting Cretaceous hard cliffs, semi-stable soft cliffs and mobile soft cliffs. The southern shore of the Isle of Wight includes a number of either submerged or partially submerged sea caves. Examples of this habitat can be found from the Needles along the south-west coast of the Island to Watcombe Bay. The site is designated under the EU Habitats Directive for its Annex I habitats which include: • Reefs • Vegetated sea cliffs • Submerged or partially submerged sea caves The conservation objectives of the South Wight SAC are to maintain in favourable condition, subject to natural change the Annex 1 habitats for which the site has been designated as listed above. Key sensitivities include coastal squeeze of cliff habitats due to erosion, development or intensive agriculture in the hinterland and development in the intertidal/subtidal habitat zones.

Site	Condition/Status	Reason for Designation
Isle of Wight Downs SAC	Designated	The Isle of Wight Downs represents one of the best examples of chalk grassland in the south of England under maritime influence. The SAC meets the coast between The Needles and Compton Bay along the south-west coast of the Isle of Wight. The exposed and weathered cliff tops provide a range of sheltered and exposed conditions. The most exposed chalk cliff tops support important assemblages of nationally rare lichens. The site is designated under the EU Habitats Directive for its Annex I habitats which include: • Dry heaths • Vegetated sea cliffs • Dry grasslands and scrublands on chalk or limestone, including important orchid sites. It is also designated for its population of early gentian, Gentianella anglica. The conservation objectives of the Isle of Wight Downs SAC are to maintain in favourable condition, subject to natural change the Annex 1 habitats and species for which the site has been designated as listed above. A key sensitivity of the SAC is that the vegetated sea cliffs are vulnerable to cliff stabilisation schemes.
Solent and Southampton Water SPA and Ramsar site	Designated	The Solent and Southampton Water SPA extends from Hurst Spit to Hill Head along the south coast of Hampshire, within the SMP area and from Yarmouth to Whitecliff Bay along the north coast of the Isle of Wight. The site is comprised of a series of estuaries and harbours with extensive mudflats and saltmarshes together with adjacent coastal habitats including saline lagoons, shingle beaches, reedbeds, damp woodland and grazing marsh. These coastal habitats are important for breeding gulls and terns, and wintering wildfowl. This site qualifies under Article 4.1 of the EU Birds Directive by regularly supporting 1% or more of the Great Britain breeding population of Annex I species. The Annex 1 species the site supports includes Mediterranean gull (*Larus melcanocephalus*), little tern (*Sterna albifrons*), roseate tern (*Sterna dougallii*) common tern (*Sterna hirundo*) and Sandwich tern (*Sterna sandvicensis*). The site also qualifies under Article 4.2 of the EU Birds Directive by regularly supporting 1% or more of the biogeographic population of migratory species and 51,381 waterfowl. The migratory species the site

Site	Condition/Status	Reason for Designation
		supports include Eurasian teal (*Anas crecca*), dark bellied Brent goose (*Branta bernicla bernicla*), ringed plover (*Charadrius hiaticula*) and black-tailed godwit (*Limosa limosa islandica*). The conservation objectives of the Solent and Southampton Water SPA are to maintain in favourable condition, subject to natural change, the habitats which support internationally important Annex I species, internationally important migratory species and internationally important assemblages of waterfowl. These habitats include sand, shingle, saltmarsh, intertidal mudflats, intertidal sandflats, boulder and cobble shore, mixed sediment shores, shallow coastal waters, saline lagoons, coastal grazing marsh, open water and terrestrial grasslands. Key site sensitivities include activities or development resulting in the physical loss of the important nesting, roosting and feeding habitats for species such as little tern (*Sterna albifrons*), roseate tern (*Sterna dougallii*), common tern, Sandwich tern (*Sterna sandvicensis*) and Mediterranean gulls (*Larus melcanocephalus*). Loss of habitat could result from maintaining coastal defences, thereby causing coastal squeeze of intertidal habitats or allowing defences protecting landward habitats to fail, thereby causing permanent inundation of these landward habitats. Disturbance is also a key sensitivity including physical disturbance through human activities and non-physical disturbance such as noise, which can have an effect by displacing birds from their feeding grounds and affect their survival. The Ramsar site extends from Hurst Spit to Gilkicker Point along the south coast of Hampshire and along the north coast of the Isle of Wight. The site comprises estuaries and adjacent habitats including intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh. The diversity of the habitats supports internationally important numbers of wintering waterfowl, important breeding gull and tern populations and an important assemblage of rare invertebrates and plants. This site is designated under the Ramsar criteria 1, 2, 5 & 6: • Ramsar criterion 1 - The site is one of the few major sheltered channels between a substantial island and mainland in European waters, exhibiting an unusual string double tide flow and has long periods of slack water at high and low tide. It includes many wetland habitats characteristic of the biogeographic region including saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs.

Site	Condition/Status	Reason for Designation
		• Ramsar criterion 2 - The site supports an important assemblage of rare plants and invertebrates; at least 39 British Red Data Book invertebrates and at least eight British red Data Book plants represented on site. • Ramsar criterion 5 – A wintering bird assemblage of international importance, an average of 51343 waterfowl per winter (5 year peak mean 1998/99-2002/2003) • Ramsar criterion 6 – species populations occurring at levels of international importance: • Ringed plover, Charadrius hiaticula (1.2% of the UK population) • Dark bellied Brent goose, Branta bernicla bernicla (3% of the UK population) • Eurasian teal, Anas crecca (1.3% of the UK population) • Black-tailed godwit, Limosa limosa islandica (3.5% of the UK population). The key wetland types present are listed below. • Rocky marine shores • Sand/ shingle shores (including sand dunes) • Intertidal mud, sand or salt flats • Saltmarshes • Coastal brackish/saline lagoons • Permanent saline/brackish/alkaline marshes/pools • Permanent freshwater marshes/pools • Freshwater, tree dominated wetlands
Solent and Dorset Coast pSPA	Designation Proposed	On January 12th, 2015, Natural England issued Technical Information Note 166 (TIN166), which proposes the designation of a new marine SPA provisional called the Solent and Dorset Coast SPA. This pSPA would be designated for its breeding colonies of sandwich tern (*Sterna sandvicensis*), common tern (*Sterna hirundo*) and little tern (*Sterna albifrons*). The pSPA would cover an area from Worbarrow Bay in the west to Middleton-on-Sea in the east, with a landward boundary at Mean Low Water where it abuts existing SPAs where terns are a feature and Mean High Water elsewhere. The seaward extent of the pSPA would cover foraging ranges from existing tern colonies known in the area.

Site	Condition/Status	Reason for Designation
Medina Estuary SSSI	Favourable	Supports internationally important over-wintering migratory populations of wildfowl and wading birds and important breeding populations of waders, gulls and terns[30].
Bouldnor and Hamstead cliffs SSSI	Favourable	Geological importance – complete succession of the series of rocks of the Oligocene age known as Hamstead Beds. Bouldnor Cliff is the principal site in Britain for fossil mammals of Oligocene age[31].
Newtown Harbour SSSI	89.33% Favourable, 10.32% Unfavourable Recovering 0.35% Unfavourable - Declining	Provides extensive estuarine mudflats and saline lagoons which support a specialised invertebrate community and internationally important over-wintering populations of wildfowl and waders and important breeding populations of waders, gulls and terns. In addition the site supports a rich flora including eight nationally scarce, three national rare and 14 nationally scarce species[32]. The *Spartina maritima* apparent within this SSSI is currently under threat from erosion.
Thorness Bay SSSI	28.35% Favourable, 71.65% Unfavourable – Declining.	The site comprises brackish marsh and considerable areas of soft maritime cliffs with large expanses of intertidal sand and shingle interspersed with rocky outcrops or ledges comprised of Bembridge Limestone. The invertebrate fauna and flora supports a large number of overwintering wildfowl and waders which contribute to an internationally important estuarine bird population of The Solent[33]. There is an area of saltmarsh habitat creation within Thorness Bay.
Headon Warren & West High Down' SSSI	Favourable 95.19% Unfavourable –Recovering 3.63%	The site comprises tertiary and Cretaceous Chalk ridges. The former, Headon Warren, supports acid, heath vegetation and the latter species-rich Cretaceous Chalk grassland. The cliffs of Alum Bay to Totland Bay demonstrate a classic section of the Lower tertiary strata and are therefore geologically important[34].
Colwell Bay SSSI	60.20% Favourable 2.49% Unfavourable – No Change 37.31% Unfavourable – Declining	Colwell Bay comprises the Headon Hill formation which yields an important late Eocene flora, 38 plant species have been described, 8 of which are unique to this locality[35].

[30] http://www.sssi.naturalengland.org.uk/citation/citation_photo/1000578.pdf
[31] http://www.sssi.naturalengland.org.uk/citation/citation_photo/1004338.pdf
[32] http://www.sssi.naturalengland.org.uk/citation/citation_photo/1004233.pdf
[33] http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000022&SiteName=Thorness Bay&countyCode=&responsiblePerson=
[34] http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000546&SiteName=Headon Warren and West High Down&countyCode=&responsiblePerson=
[35] http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1004379&SiteName=Colwell Bay&countyCode=&responsiblePerson=

Site	Condition/Status	Reason for Designation
Yar Estuary SSSI,	83.15% Favourable 16.85% Unfavourable – Recovering	The Yar supports a wide range of estuarine and coastal habitats and is an important part of the Solent estuarine system which supports nationally important over-wintering populations of wildfowl and waders[36].
Freshwater Marshes SSSI.	86.78%Unfavourable – Recovering 13.22% Unfavourable – No Change	Occupies the upper reaches of the drowned estuary of the River Yar. The marshes are the best example of base-enriched fen on the Isle of Wight and mainly comprise extensive areas of tall fen vegetation dominated by common reed *(Phragmites australis)* interspersed with blocks of sallow *Salix* species[37]. A portion of the marshes is also designated as a local nature reserve.
Newtown Estuary NNR	Not applicable	A reserve on the northern coast of the Isle of Wight which comprises areas of estuary and foreshore with extensive mudflats and saltmarsh alongside adjacent meadows and woodland[38]. Newton Estuary is also part of the area designated as a SPA, Ramsar site and SAC.
Bouldnor Copse SINC	Landslip SSSI – Favourable	A mixed woodland (some of which is designated as an ancient woodland) on the north coast with a landslip SSSI, a derelict WWII gun battery, and a large Red Squirrel population. In addition the coast supports heathland vegetation
Hart's Farm Meadows SINC	N/A	Coastal and floodplain grazing marsh which also act as a high tide roost.
Freshwater Bay Cliffs SINC	N/A	Contains a variety of species including National Biodiversity Action Plan species.
Fort Victoria SINC	N/A	As above.
The Shrape SINC	N/A	The Shrape Muds are located at East Cowes and provide a large area of intertidal mudflats which support an important area of eel grass beds and seagrass beds[39].
Springhill/Western Wood SINC	N/A	Located within the North-eastern woods area of the Isle of Wight[40].

[36] http://www.sssi.naturalengland.org.uk/citation/citation_photo/1000838.pdf

[37] http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1004406&SiteName=Freshwater Marshes&countyCode=&responsiblePerson=

[38] https://www.gov.uk/government/publications/the-isle-of-wights-national-nature-reserve/newtown-harbour-nnr

[39] http://old-iwight.onthewight.com/living_here/environment/estuaries/Estuary_Management/natureco-2.html

[40] http://www.wildonwight.co.uk/graphics/boa-maps/boa-pdfs/northeastern-woods.pdf

Site	Condition/Status	Reason for Designation
The Needles	Recommended Marine Conservation Zone (rMCZ)	The Needles is currently undergoing consultation (tranche 2) as to the proposal that it is designated as a MCZ. The site comprises a number of rare and fragile habitats such as subtidal chalk, shallow water rock and soft sediments which support communities of algae, sea squirts and delicate anemones. Seagrass beds in Totland and Colwell Bays support Sea Hare and Peacock's Tail. The site is also important or the native oyster[41].
Yarmouth to Cowes	Recommended Marine Conservation Zone (rMCZ)	This rMCZ has not been put forward for tranche 2 consultation. This rMCZ contains large seagrass beds around Yarmouth and Bouldnor with some of the best peat and clay exposures in the region[42].
Dodnor Creek	Local Nature Reserve	The nature reserve is located approximately one mile north of Newport. Habitat features include a wetland with pond, willow scrub and reed beds. The Old Millpond is home to a number of species of birds and Dickson's Copse (to the east of the reserve) is part ancient woodland[43].

[41] The Needles: Recommended Marina Conservation Zone (January 2015) https://consult.defra.gov.uk/marine/tranche2mczs/supporting_documents/The%20Needles%20rMCZ%20site%20summary.pdf

[42] http://www.wildlifetrusts.org/MCZ/yarmouth-to-cowes#status

[43] Natural England: Local Nature Reserves (Dodnor Creek) http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_details.asp?ID=498

Appendix B

Mitigation measures identified by the RBMP

Waterbody	Mitigation measure identified	Is the measure in place?
Caul Bourne	Appropriate techniques to align and attenuate flow to limit detrimental effects of these features (drainage)	In Place
Solent (Coastal)	Manage disturbance	In Place
Solent (Coastal)	Site selection (dredged material disposal) (e.g. avoid sensitive sites)	In Place
Solent (Coastal)	Sediment management	In Place
Medina (Transitional)	Reduce impact of dredging	Not in Place
Medina (Transitional)	Prepare a dredging/disposal strategy	Not in Place
Medina (Transitional)	Avoid the need to dredge (e.g. minimise under-keel clearance; use fluid mud navigation; flow manipulation or training works)	Not in Place
Solent (Coastal)	Indirect/offsite mitigation (offsetting measures)	Not in Place
Solent (Coastal)	Managed realignment of flood defence	Not in Place
Caul Bourne, River Medina, Lukely Brook, Solent (Coastal)	Preserve and where possible enhance ecological value of marginal aquatic habitat, banks, and riparian zone	Not in Place
Caul Bourne, River Medina, Solent (Coastal)	Removal or hard bank reinforcement/revetment, or replacement with soft engineering solution	Not in Place
Caul Bourne, River Medina	Appropriate water level management strategies, including timing and volume of water removed	Not in Place
Caul Bourne, River Medina	Retain marginal aquatic and riparian habitats (channel alteration)	Not in Place
Caul Bourne, River Medina, Lukely Brook	Operational and structural changes to locks, sluices, weirs, beach control etc.	Not in Place
Caul Bourne, River Medina, Lukely Brook	Structures or other mechanism in place and managed to enable fish to access waters upstream and downstream of the impounding works	Not in Place

Waterbody	Mitigation measure identified	Is the measure in place?
Caul Bourne, River Medina, Lukely Brook	Alteration of channel bed (with culvert)	Not in Place
Caul Bourne, River Medina, Lukely Brook	Re-opening existing culverts	Not in Place
Caul Bourne, River Medina, Lukely Brook	Increase in-channel morphological diversity	Not in Place
Caul Bourne, River Medina, Lukely Brook	Preserve and, where possible, restore historic aquatic habitats	Not in Place
Caul Bourne, River Medina, Lukely Brook	Remove obsolete structures	Not in Place
River Medina, Lukely Brook	Educate landowners on sensitive management practices (urbanisation)	Not in Place
Lukely Brook	Removal of hard bank reinforcement/revetment, or replacement with soft engineering solution	Not in Place
Lukely Brook	Flood bunds (earth banks, in place of floodwalls	Not in Place
Lukely Brook	Set-back embankments	Not in Place
Lukely Brook	Improve floodplain connectivity	Not in Place
Lukely Brook	Selective vegetation control technique	Not in Place
Lukely Brook	Appropriate vegetation control technique	Not in Place
Lukely Brook	Appropriate timing (vegetation control)	Not in Place
Lukely Brook	Appropriate techniques (invasive species)	Not in Place
Lukely Brook	Retain marginal aquatic and riparian habitats (channel alteration)	Not in Place
Lukely Brook	Sediment management strategies (develop and revise)	Not in Place
Lukely Brook	Appropriate channel maintenance strategies and techniques – minimise disturbance to channel bed and margins	Not in Place
Lukely Brook	Appropriate channel maintenance strategies and techniques – woody debris	Not in Place
Lukely Brook	Appropriate techniques to align and attenuate slow to limit detrimental effects of these features (drainage)	Not in Place

Waterbody	Mitigation measure identified	Is the measure in place?
Lukely Brook	Management of the risk of fish entrainment in intakes for hydropower turbines or water resource purposes (or pumping stations) where there is downstream fish migration.	Not in Place

Appendix C

Isle of Wight Policy Units from the SMP2

SMP - PU6A.1	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
Freshwater Bay	Short section of HTL provides flood defence for the Western Yar Valley (with 6C.3). Maintain the road and support or enhance the protective beach. Provides flood defence for numerous properties in Freshwater and the Western Yar Valley. The preferred plan maintains the coastal road and seeks to support or enhance the protective beach. The shoreline and its habitats will continue to be heavily modified by defences and natural processes will be constrained. This could lead to coastal squeeze and reduction in intertidal habitat area.		
SMP - PU6A.2	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Tennyson Down, Alum Bay and Headon Warren	No impact along the majority of the frontage. Properties on the margins of Freshwater and Totland affected in the medium to long term. Cliff-top facilities at the edge of the Alum Bay park also at risk, although the main buildings are set back from the cliff edge. The preferred plan for a non-interventional approach will generally support the core objectives of the SAC and SSSI.		
SMP - PU6B.1	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
Totland and Colwell	Preferred plan will support protection of properties. The shoreline and its habitats will continue to be heavily modified by defences and natural processes will be constrained. This could lead to coastal squeeze and reduction in intertidal habitat area.		
SMP - PU6B.2	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Central Colwell Bay	Continuing cliff retreat will affect part of the cliff-top Holiday Park. Little natural change expected. Preferred plan will support SMP high level nature conservation objectives and geological interest. Continued sediment supply to the system will support beach widths in this area.		
SMP - PU6B.3	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**

Fort Albert	Existing structures can be maintained to extend their life, but in the long term access to Fort Albert and the Fort and cliff top properties will be at risk. Increasing erosion from the adjacent units to the north and south will also increase the risk to cliff top chalets and buildings. The shoreline will be subject to coastal squeeze in the short term with a move to natural processes in the final epoch.		
SMP - PU6B.4	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Fort Victoria Country Park	No impacts on property. Some loss of land at Fort Victoria Country Park. Plan would increase intertidal foreshore area. Landscape may be altered under no active intervention but not adversely.		
SMP - PU6B.5	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**No Active Intervention**	**No Active Intervention**
Fort Victoria and Norton	Fort Victoria and some surrounding properties at risk in the long term. Access to the area may be affected in the medium term. Landscape may be altered under no active intervention but natural processes will drive the resulting landscape.		
SMP - PU6C.1	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
Norton Spit	No impacts on property. Holding the line of defence will prevent the dunes, which are a designated feature of the Solent Maritime SAC from migrating south and possibly breaching. Use of harbour maintained and supported.		
SMP - PU6C.2	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Western Yar Estuary - west	No impact along the majority of the frontage. Potential flood risk to some buildings near Salterns Wood and Kings Manor Farm. The preferred plan for a non-interventional approach will generally support the core objectives the Estuary. Preferred plan will support the landscape value and the AONB designation. The wide, varied and hugely important amenity use of the estuary would be supported by the plan.		
SMP - PU6C.3	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
The Causeway	Short section of HTL provides flood defence from Freshwater (with PU6A.1). Widespread properties and core land use along the Western Yar valley protected under the preferred plan. The preferred plan for a non-interventional approach will generally support the core objectives the Estuary, although the tidal flow to the south will remain restricted at this point. Freshwater habitats upstream will be maintained.		
SMP - PU6C.4	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**

	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Western Yar Estuary - east	No risk to properties. The preferred plan for a non-interventional approach will generally support the core objectives the Estuary. The wide, varied and hugely important amenity use of the estuary would be supported by the plan. Some access points and shoreline pathways may need to be re-positioned over time. Future risk to the cycle route would require adaptation to sustain use of the important route.		
SMP - PU6C.5	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Managed Realignment**	**No Active Intervention**
Thorley Brook and Barnfields Stream	HTL in the first epoch and MR in the second epoch provide opportunity to address and reduce potential tidal flood risk to localised areas of property adjacent to the proposed new tidal floodplains. HTL in the first epoch will allow time to plan for habitat adaption. MR then NAI in the medium and longer term will restore more natural behaviour and operation of these inlets with benefits for the nature conservation interest, although some habitat change will occur.		
SMP - PU6C.6	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
Yarmouth to Port la Salle	A large number of properties protected from flood and erosion risk under the preferred plan. Key transport routes are maintained. The shoreline and its habitats will continue to be modified by the defences and natural processes will be constrained.		
SMP – PU7.1	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Bouldnor Copse and Hamstead	Allow cliff erosion, supporting the natural habitats. No impact along the majority of the frontage. Risk to several properties near Cranmore in the medium to long term. The preferred plan for a non-interventional approach will generally support the core objectives of all the designations. Continued sediment supply to the system will support beaches in the area, although this coast is relatively inaccessible.		
SMP – PU7.2	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Newtown Estuary	Allow tidal flooding and erosion. This would not preclude local management by the landowner during the first epoch to maintain limited quay structures and access walkways. The preferred plan for a non-interventional approach will generally support the core objectives of all the designations. There will be loss of the salt ponds with sea level rise.		
SMP – PU7.3	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**

Thorness Bay and southern Gurnard Bay	Allow cliff erosion, supporting the natural habitats. No impact along the majority of the frontage. Risk to parts of the Thorness Bay holiday park and scattered building between Thorness and Gurnard Luck in the medium to long term. Continued sediment supply to the system will support beaches in the area.		
SMP – PU1A.1	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**No Active Intervention**	**No Active Intervention**
Gurnard Luck	Potential longer term impact on property and the community. Supports SAC designation. Support quality of, and access to, beach. In the longer term new access would need to be considered.		
SMP – PU1A.2	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Gurnard Cliff	Property set back on the cliff top further away from eroding cliff. Supports SAC designation and natural processes.		
SMP – PU1A.3	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
Gurnard to Cowes Parade	A large number of properties continue to be defended against flooding, erosion and landslide reactivation. Historic landscape of Cowes waterside is maintained under the preferred plan. Impacts should generally be neutral.		
SMP – PU1A.4	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
West Cowes	A large number of properties continue to be defended against flooding. Links to mainland via ferry terminal are protected. Historic landscape of West Cowes quayside is maintained, dependent on method of 'Holding the Line' applied (HTL) Consideration that the landscape of the town may change in the third epoch with SLR under the preferred plan. Maintaining frontline defences at along West Cowes promenade will provide continued areas of access.		
SMP – PU1A.5	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
East Cowes	A large number of properties continue to be defended against flooding. Links to mainland via ferry terminal are protected. Historic landscape of East Cowes quayside is maintained, dependent on method of HTL. Consideration that the landscape of the town may change in the third epoch with SLR under the preferred plan. Maintaining frontline defences at quay will provide continued areas of access.		
SMP – PU1A.6	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**No Active Intervention**	**No Active Intervention**

East Cowes Outer Esplanade	Longer term loss of car parking & access road along the promenade. Supports SAC designations. Maintains landscape quality.		
SMP – PU1B.1	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Central Medina – NW	Longer term inundation of surrounding natural waterside. Natural estuary evolution will continue, is a positive benefit. Supports SPA, SSSi and Ramsar designation. Preferred policy would maintain landscape in current form with some loss of terrestrial land to flood and erosion.		
SMP – PU1B.2	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
West Medina Mills	Commercial property can be maintained through private defences. Would prevent natural processes along this estuary stretch.		
SMP – PU1B.3	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Central Medina – SW	Longer term flooding impacts on gardens and properties. Natural estuary evolution will continue, is a positive benefit. Supports SPA, SSSI and Ramsar designation. Preferred policy would maintain landscape in current form with some loss of terrestrial land to flooding.		
SMP – PU1B.4	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	Hold the line	**Hold the line**	**Hold the line**
Newport Harbour	A large number of properties continue to be defended against flooding. Historic landscape of Newport quayside is maintained under the preferred plan.		
SMP – PU1B.5	**Year 0-20 (2025)**	**Year 20-50 (2055)**	**Year 50-100 (2105)**
	No Active Intervention	**No Active Intervention**	**No Active Intervention**
Central Medina –East	Longer term flooding impacts on properties and longer term inundation of natural waterside. Natural estuary evolution will continue is positive benefit. Supports SPA, SSSi and Ramsar designation. Preferred policy would maintain landscape in current form with some loss of terrestrial land to flood and erosion.		

Appendix D

Isle of Wight SMP (2011) WFD Assessment of Impact and Summary Statements

Table D1 – Isle of Wight SMP WFD Assessment of Impacts

SMP Policy Development Zone	Waterbody	Strategy Option Development Unit	SMP2 WFD Assessment of Impact
PDZ6 - Freshwater Bay to Port la Salle	Dorset / Hampshire (Coastal)	W1 (part)	The coastline from Freshwater Bay and around the north side of the Needles includes an extensive tide-exposed chalk reef that supports a diverse range of species both in the intertidal and subtidal, whilst the cliffs above support ecologically important chalk plants (e.g. lowland heath and acid grasses) and invertebrates. The reefs are some of the most important subtidal chalk reefs in Britain, with the only known Chalk subtidal caves in the UK. As for other sections of coastline on the Isle of Wight this frontage is a mixture of NAI so allowing the cliffs to evolve and erode naturally and also HTL in order to protect communities and important infrastructure. Again the potential for the frontages that are allowed to erode to outflank those that are protected exists. A HTL policy at Freshwater Bay has the potential to affect some of the BQEs within the Dorset / Hampshire coastal water body such as invertebrates within the subtidal sediments and macroalgae on the subtidal reefs. However, the overall effect is unlikely to deteriorate the TraC water body as a whole, because it is such a small area that is defended, **therefore the SMP2 policy is unlikely to cause any changes to the Dorset / Hampshire TraC's present quality of Good Ecological Potential.**
	Solent (Coastal)	W1 (part) – W9 (part), W16 – 17	Where the HTL policy is in place for this PDZ within the Solent TraC (PU's 6B.1, 6B.3 and 6B.5) the already narrow tide-exposed reef will become more sub-tidal and not be replaced by new intertidal over time. This is really only a risk at Totland and Colwell, as at Fort Albert and Fort Victoria and Norton the aim is to allow the coastline to develop naturally in the long term once the life of the defences have exceeded. The BQEs could therefore be only adversely affected along Totland and Colwell in the medium to long term as the sea levels start to significantly rise and completely submerge any intertidal reefs. The overall policy along this frontage will result in several increasingly fragmented stretches of defences separated by lengths of rapidly retreating coastal cliffs. **This could result in the Ecological Potential of this TraC (Solent) water body from failing to meet Good Ecological Potential by 2027.**
	Western Yar (Transitional)	W9 (part) – W17	The Western Yar is a wide-bottomed valley type estuary with relatively steeply sloping margins which has extensive saltmarsh (angiosperm) and mudflats. The mouth of the estuary is protected by Norton Spit, which is presently defended from overtopping and migrating landwards by wooden groynes. There are three FWBs leading into the estuary, the Western Yar, Thorley Brook and Barnfields Stream. There is a combination of HTL policy to protect the community of Yarmouth and its important infrastructure links with the mainland and NAI policy to allow the estuary to develop more naturally. The saltmarsh habitats within the estuary are likely to be sensitive to future climate change and sea-level rise unless vertical accretion can compensate. Where there are HTL policies within the estuary, i.e. at the Causeway and around Yarmouth to Port la Salle there will be coastal squeeze as the sea levels rise, which will affect the BQEs of the Western Yar TraC (i.e. benthic invertebrates, angiosperms and fish, since natural migration inland will not be able to occur. The HTL policy will however ensure that the **environmental objectives of the Western Yar estuary are not compromised,** since with sea level rise the lower and upper levels of the FWB would be flooded right back to the source at Freshwater Bay. The policy of NAI at Thorley Brook and Barnfields Stream (PU6C.5) in the second and third epochs will allow saline intrusion up these FWBs rather than to continue to unsustainably hold tidal flooding by the defences that are presently there. The

SMP Policy Development Zone	Waterbody	Strategy Option Development Unit	SMP2 WFD Assessment of Impact
			HTL policy in the first epoch will be to allow the gradual management of the flood levels so that there is an adaptation of habitats is gradual over time. Even though there will be saline intrusion into previously freshwater habitats of the FWBs, the SMP2 will however help in attaining some of the environmental objectives of the Thorley Brook and Barnfields Stream FWBs, in particular the former; these include 're-opening existing culverts' and 'preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone'. Overall, the SMP2 policies will have an affect on some of the BQEs within the Western Yar TraC, though with the NAI policy at Thorley Brook and Barnfields Stream the estuary will be able **to adapt more naturally with climate change and help to attain the environmental objectives of the Western Yar TraC to ensure its meets surface water Good Ecological Potential by 2027.**
PDZ7 - Port la Salle to west of Gurnard	Solent (Coastal)	W18, W19 (part), W20	The coastline from Bouldnor Copse to Hamstead comprises geologically important soft cliffs with the intertidal area littered with debris from semi-circular landslides and exposed clay bedrock. The NAI policy will ensure that coastal processes continue to erode these cliffs and supplying sediment downdrift, so as to maintain morphological features elsewhere within the coastal water body, such as the spits at the mouth of Newtown Estuary. Thorness Bay and southern Gurnard Bay comprise considerable areas of soft maritime cliffs with large expanses of intertidal sand and shingle interspersed with rocky outcrops or ledges composed of Bembridge Limestone. There are also two small areas of brackish marsh (one known as Thorness Marshes), which are at the coastal margins of Little Thorness Stream and Great Thorness Stream, both FWBs; the former of Moderate Ecological Status and the latter of Moderate Ecological Potential. The policy of NAI will ensure natural coastal processes continue to erode the coastline, supplying both important sediment to the sandy foreshores and exposing further ledges for macroalgae and their associated communities to colonise in pace with sea level rise. As sea levels rise, the extent of saline intrusion up the FWBs will increase, though at a gradual rate so that BQEs can adapt over time. **Therefore, the SMP2 policy will not therefore cause any detrimental changes to the Solent TraC that would result in it not meeting Good Ecological Potential 2015. In addition, the environmental objectives of the two FWBs will not be prevented as a result of the NAI policy.**
	Newtown River (Transitional)	W19	Newtown Harbour comprises a number of tidal creeks leading to a number of freshwater creeks and streams (though these will not be affected by changes in 1 in 1000 year flood zone from the present to 2110). The estuary area includes extensive areas of estuarine mudflat, saltmarsh, coastal grazing marsh and saline lagoons that support internationally important overwintering and breeding bird species. The BQEs within the estuary include macroalgae, benthic invertebrates, angiosperms (saltmarsh, coastal grazing marsh and seagrass beds) and fish. The policy of NAI for the entirety of the estuary will ensure that **the SMP policy, neither deteriorates the Moderate Ecological Status of the Newtown Estuary TraC, nor will it cause failure to meet Good Ecological Status in 2027.**

SMP Policy Development Zone	Waterbody	Strategy Option Development Unit	SMP2 WFD Assessment of Impact
PDZ 1 - West of Gurnard to East Cowes	Solent (Coastal)	W21 – W23	At Gurnard Luck there is ongoing erosion along the frontage. HTL will maintain the defence and later NAI will not preclude private maintenance of defences. As sea level rises the intertidal area will be lost. However, the intertidal here is very mobile with sands and gravels dominating; there is limited benthos and macroalgae present. NAI has the potential to impact the FWB Gurnard Luck (GB6240) south of Gurnard Holiday village through changes to salinity, inundations and the presence of macrophytes due to saline inundation, which would impact on the freshwater BQEs. However, this would be ensuring the area is more sustainable, and providing the adaptation is done so as to allow macrophytes to adapt to saline inundation, the policy will not result in the failure to meet Good Ecological Status. A sewage network pumping station (water company) on Marsh Road lies within the Flood Zone 2 boundaries and is therefore at risk from flooding and potentially causing contamination of the Solent coastal water body. At Gurnard Cliff NAI will continue to allow the cliff to erode naturally. Between Gurnard and Cowes Parade the defence of the road, the Parade and properties requires HTL policy. This will lead to loss of intertidal along this frontage. However there will be limited effect on benthos and macroalgae and is **unlikely to contribute to the deterioration of Moderate Ecological Potential or attaining Good Ecological Potential by 2015**.

SMP Policy Development Zone	Waterbody	Strategy Option Development Unit	SMP2 WFD Assessment of Impact
	Medina (Transitional)	W24 – W32	Sediment build up has formed characteristic mudflats covering 66 hectares which support a large number of species, including shellfish, algae and locally and regionally important species of worm, also important sources of food for fish and bird populations. The proposed policies for this water body are HTL or NAI. HTL is necessary to defend properties and business along the estuary. Where NAI is proposed this is to allow the estuary to return to as natural a state as possible, though it will not preclude the maintenance of private defences (a course of action to be expected). The central section of the estuary is moderately defended either with private or public defences, with the eastern side of the Medina being less defended than the west. NAI for the most of the central estuary will therefore allow the migration of the riparian banks with increasing sea levels, ensuring there is little coastal squeeze of the saltmarsh and mudflats. However, as sea levels rise coastal squeeze will occur where the defence line is held. The estuary has lost 10ha of saltmarsh (an angiosperm) since the 1940s due to development, dredging and to a lesser extent through natural processes. Further saltmarsh and intertidal mudflats will be lost due to coastal squeeze where policy is to maintain the defences. BQEs such as benthic invertebrates, macroalgae and fish could be affected. There are a number of historic and current contamination risks along the Medina Estuary, where SMP policy could affect the achievement of the WFD objectives for surface water bodies. West Medina Mills has a policy of HTL to protect the important wharf and associated business. An NAI policy would cause contamination issues due to historic contamination associated with dock and wharf activities at West Medina Mills and the Stag Lane landfill site. There is a closed Waste Water Treatment plant (Fairlee) on the eastern bank of the Medina which falls under the NAI policy. The area is presently undefended, though there is a small risk of flooding up to Little Copse, and depending on the works there could contamination of the Medina River. However, since there are presently no defences there it is unlikely that there is a risk of contamination and therefore unlikely to fail the WFD objective. **Hence, deterioration in surface water Ecological Potential of the transitional water body (Medina) is unlikely since previously defended areas are no longer going to be defended; however, attaining Good Ecological Potential by 2027 will still be affected by a moderate proportion of defences being held.** In addition, NAI within the central east and west Medina has the potential to impact the lower reaches of the landward FWBs of 'Dodnor Creek' (in PU1B.2) and 'Alverstone Stream' (PU1B.5) through changes in salinity and inundations, which would impact on the freshwater BQEs. Alverstone Stream is currently protected from extended saline intrusion from defences that hold the Island Harbour Marina, whilst Dodnor Creek protected with a managed sluice. A policy of NAI is unlikely to affect environmental objectives of the Alverstone Stream, since the Marina is likely to maintain their defences and therefore there will be no increased saline intrusion. A NAI policy will mean that tidal flooding will occur within Dodnor Creek ('not designated a HMWB') and there will be losses of the freshwater BQEs around the lower reaches of the stream. However, this will be returning it to a more natural state of equilibrium. The head of the Medina Estuary is defended to protect the community of Newport, and therefore also prevents saline intrusion of the lower reaches of the River Medina FWB. Therefore the HTL will ensure that WFD objective for this FWB is not compromised because of the SMP policy, thus ensuring that **the SMP2 is not the reason for any failure to meet Good Ecological Potential for the Medina FWB**.

Table D2 – Isle of Wight SMP WFD Assessment of Impacts

Waterbody	PDZ	Achievement of South East RBMP Mitigation Measures	Overriding public interest	Better environmental options	Effect on other Waterbodies	Other issues
Solent (Coastal)	6, 7, 1	• **Managed realignment of flood defence -** not wholly incorporated but NAI at Gurnard Luck (**PU1A.1**) will result in the flooding the lower reaches of small valley, thereby creating mudflat and saltmarsh habitats. • **Preserving and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone -** Gurnard Luck (**PU1A.1**) will result in the flooding the lower reaches of small valley, thereby enhancing the ecological value of mudflat (benthic invertebrates) and saltmarsh (angiosperm) habitats.	The policy of maintaining the defences (i.e. HTL) at Totland and Colwell Bay are required to preserve the integrity of residential property and infrastructure, which are reasons of overriding public interest and benefits.	There are no significantly better environmental policy options available, since policies of no active intervention or managed realignment along the frontages at Totland and Colwell Bay would result in the loss of the communities from coastal erosion rather than coastal flooding, as well as the nationally important transport link to the mainland. Advancing the line is unrealistic, unnecessary and it would be working against the natural processes at work in these areas, thus resulting in further intertidal loss (i.e. rocky shores and mudflats).	The Environment Agency Flood Map and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. It is considered unlikely that any groundwater bodies will be impacted as a result of the SMP2 policies as there is no current evidence of saline intrusion. There are no SMP2 policies within this water body that have the potential to affect landward FWBs. SMP2 policies for PDZs in the adjacent TraC water bodies (Dorset / Hampshire, Western Yar, Newtown River and Medina) have also been assessed within this report for potential to cause deterioration in Ecological Status / Potential.	This water body includes part of the Solent Maritime SAC and Solent and Southampton SPA and Ramsar sites and Ryde Sands and Wootton Creek SSSI, and several classes of UKBAP habitat (in particular, mudflats and saltmarsh). The intent of the SMP2 policy within PDZs 6 within this water body is to defend Totland and Colwell Bay, whilst allowing the coastline to develop naturally where there are high nature conservation interests or it is not economically feasible to maintain defences. The SMP2 policies have the potential to result in some degree of losses, and only marginal gains, of designated habitat and this has been assessed within the Habitats Regulations Assessment in Appendix I of the SMP2.

Waterbody	PDZ	Achievement of South East RBMP Mitigation Measures	Overriding public interest	Better environmental options	Effect on other Waterbodies	Other issues
Medina (Transitional)	1	There were no relevant measures to the SMP2.	The policy of maintaining the defences around Cowes, East Cowes and Newport Harbour is required to protect important communities, nationally important infrastructure (e.g. ferry link with the mainland, historic landfill sites), commercial assets (e.g. West Medina Mills Wharf), and recreational (e.g. Island Harbour Marina, Cowes Yacht Club) and heritage assets. This is necessary to ensure the continued role of these two communities at the either end of the Medina Estuary.	There are no significantly better environmental policy options available – NAI would immediately cease to defend Cowes and East Cowes, particularly as the present defences need to be enhanced to protect the communities from any future coastal flooding. This would also be case for Newport, which is the commercial centre for the Isle of Wight. ATL at the entrance to the estuary is a possibility and was considered. However, this is technically difficult, would require increasing flood defence management, cause the loss intertidal and subtidal habitat and would potentially change the hydrodynamics and morphology of the Medina Estuary, thus affecting the BQEs to a greater degree than a HTL policy. As part of the SMP process various policy packages were developed for each PDZ and were fully appraised against SMP Objectives (which includes an objective on adaptation through supporting and enhancing nature conservation value of the Medina).	The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. It is considered unlikely that any groundwater bodies will be impacted as a result of the SMP2 policies as there is no current evidence of saline intrusion. There is the potential for impacts on Dodnor Creek, a freshwater creek, if a policy of NAI is implemented. However, the mitigation measures documented should help to minimise any impacts on these water bodies, and by allowing the opening up of the entrance of this FWB to the estuary it is reverting to a more natural and sustainable environment. There will be no effect on the River Medina FWB, since the HTL policy at Newport Harbour will ensure that saline intrusion further upstream does not occur, however any maintenance works to these structures around Newport Harbour, including any sluices must be done so in accordance with the South East RBMP mitigation measures to ensure Good Ecological Potential can be attained by 2027.	This water body includes part of the Solent Maritime SAC, Solent and Southampton Water SPA and Ramsar site and the Medina Estuary SSSI and mudflats that are a UK Biodiversity Action Plan habitat. The intent of the SMP2 policy is to allow the estuary to develop naturally, whilst defending the integrity of nationally and regionally important communities, infrastructure and commercial assets. The SMP2 policies have the potential to result in some degree of losses, and only marginal gains, of designated habitat and this has been assessed within the Habitats Regulations Assessment in Appendix I of the SMP2.

Waterbody	PDZ	Achievement of South East RBMP Mitigation Measures	Overriding public interest	Better environmental options	Effect on other Waterbodies	Other issues
Dorset/Hampshire (Coastal)	6	There were no relevant measures to the SMP2 for this water body. WFD Summary Statement is not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP policies.				
Western Yar (Transitional)	6	There were no relevant measures to the SMP2 for this water body. There were however, three mitigation measures for Thorley Brook FWB (GB6060) that have been attained by the SMP2 policies • **Retain marginal aquatic and riparian habitats (channel alteration)** - MR/NAI policy at Thorley Brook and Barnfields Stream (**PU6C.5**) will result in a more natural functioning riparian system, particularly in the transition between the freshwater aspects of these two small rivers and the brackish nature of the Eastern Yar estuary. • **Preserve, and where possible, enhance ecological value of marginal aquatic habitat, banks and riparian zone** – MR/NAI policy at Thorley Brook and Barnfields Stream (**PU6C.5**) will result in the flooding the lower reaches of the valley floor of these two rivers, thereby enhancing the historic ecological value of marginal aquatic habitat, mainly of saltmarsh and grazing marsh (angiosperms) habitats. • **Re-opening existing culverts** - MR/NAI policy at Thorley Brook and Barnfields Stream (**PU6C.5**) will open up the existing culvert to allow the slow gradual saline inundation until the valley	The policy of hold the line of existing defences at The Causeway in PDZ 6 is required to protect the communities and transport links (A and B roads) of Freshwater through to Freshwater Bay from tidal flooding, as well as the loss of Freshwater Marshes on the landward side of the defences. The hold the line policy for around Yarmouth to Port la Salle is to ensure that the community of Yarmouth and its nationally important transport link to the mainland are maintained, as well as protecting the tourism and heritage assets of the town. Therefore, it is undoubtedly clear that the HTL policy has been selected for reasons of overriding public interest, as well as for the natural environment. Within the Estuary, the plan supports the need for no active intervention and removal of existing defences to allow the limited areas of low lying land to flood, so as to address the impact of sea level rise on designated	There are no significantly better options available - as part of the SMP process various policy packages were developed for each PDZ and were fully appraised against SMP Objectives (which includes an objective on adaptation through supporting and enhancing nature conservation value of the Medina). Further detail on the Option Development and Appraisal can be found in Strategy **Appendix F** and the Preferred Policy Appraisal can be found in **Appendix G of theSMP2 document**. A managed realignment option may not be technically unfeasible at The Causeway and would allow the Western Yar valley to revert to a more natural and sustainable state. However, it would result in the creation of an island if there were to be a combined breach at Freshwater Bay. This option would however, be disproportionately costly to provide both damage costs to flooded properties, access to the newly formed island and to find compensation for the lost freshwater habitats at Freshwater Marshes.	The Environment Agency Flood Map application, groundwater maps and the South East RBMP have been consulted to check for landward freshwater and groundwater bodies that could be impacted by the SMP2 policies. It is considered unlikely that the Isle of Wight Solent Group GWB will be impacted as a result of the SMP2 policies as there is no current evidence of saline intrusion since they are designated as 'Good Status' (see **Assessment Table 3** and **Sections J3.1** and **J3.3**). The preferred policy of HTL ensures that the environmental objectives of the Western Yar (Headwater) are maintained. The policy combination of the SMP2 will have a permanent effect on Thorley Brook and Barnfields Stream FWBs, since they will result in saline intrusion in the lower reaches of the FWBs causing habitat loss of extensive areas of freshwater habitats. However, the policy combination does follow the mitigation measure stated in the South East RBMP of "re-opening existing culverts" particularly as the both these freshwater bodies have been designated heavily modified	This water body includes part of the Solent and Southampton SPA and Ramsar site, Yar Estuary SSSI, and several classes of UKBAP habitat, importantly intertidal mudflat and saltmarsh. The intent of the SMP2 policy is to defend the integrity of the communities of Yarmouth and Freshwater, as well as transport links and importantly the natural and sustainable evolution of the Western Yar estuary. The losses and gains of designated habitat as a result of this policy are discussed in detail in the Habitats Regulations Assessment in **Appendix I of the SMP document**.

Waterbody	PDZ	Achievement of South East RBMP Mitigation Measures	Overriding public interest	Better environmental options	Effect on other Waterbodies	Other issues
		naturally floods without any culvert or defences in the medium to long term.	habitat - i.e. IROPI and benefits to sustainable development.	The MR/NAI policy combination at Thorley Brook and Barnfields Stream could feasibly remain a HTL policy. A HTL policy would be financially unsustainable in the long term, not to mention unsustainable from an environmental perspective. The costs of maintaining the defences against sea level rise to protect coastal grazing marsh and freshwater habitats from tidal flooding is likely to be higher than the compensation for flooding adjacent Grade 3 and 4 agricultural land and mitigation/compensation for the loss of intertidal habitats within the estuary as a result of HTL	water bodies due to urbanisation and flood protection. SMP2 policies for PDZs in the adjacent TraC water body (Solent) have also been assessed within this report for potential to cause deterioration in Ecological Status / Potential.	
Newtown River (Transitional)	7	There were no relevant measures to the SMP2 for this water body. WFD Summary Statement is not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP policies.				

Appendix E

Option Development Unit Strategy Water Framework Directive Summary Table

SMZ	PU	2015			2025			2055		
		Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion	Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion	Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion
1	W1	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-
2	W2	Maintain coastal access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain coastal access and H&S compliance & CCMA	No change or deterioration of WFD Objectives	-	Implement CCMA and adaptation	No change or deterioration of WFD Objectives	-
2	W3	Maintain coastal access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain coastal access and H&S compliance & CCMA	No change or deterioration of WFD Objectives	-	Implement CCMA and adaptation	No change or deterioration of WFD Objectives	-
2	W4	Maintain coastal access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain coastal access and H&S compliance & CCMA	No change or deterioration of WFD Objectives	-	Implement CCMA and adaptation	No change or deterioration of WFD Objectives	-
2	W5	Maintain coastal access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain coastal access and H&S compliance & CCMA	No change or deterioration of WFD Objectives	-	Implement CCMA and adaptation	No change or deterioration of WFD Objectives	-
2	W6	Maintain coastal access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain coastal access and H&S compliance & CCMA	No change or deterioration of WFD Objectives	-	Implement CCMA and adaptation	No change or deterioration of WFD Objectives	-
2	W7	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-
3a	W8	Maintain access and H&S	No change or deterioration of WFD Objectives	-	Maintain access and H&S, where appropriate	No change or deterioration of WFD Objectives	-	Health & Safety works as required	No change or deterioration of WFD Objectives	-
3a	W9	Maintain and upgrade / refurbish in corner	No change or deterioration of WFD Objectives	-	Maintain and upgrade / refurbish in corner	No change or deterioration of WFD Objectives	-	Maintain and upgrade	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives
3b	W10	Maintain access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain access and H&S compliance	No change or deterioration of WFD Objectives	-
3c	W11	Maintain Causeway and PLP	No change or deterioration of WFD Objectives	-	Refurbish and PLP	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives	Recommend new defences at Freshwater village to prevent tidal flooding to residential and commercial properties near the A3055	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives

SMZ	PU	2015			2025			2055		
		Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion	Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion	Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion
3c	W12	Maintain seawall	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives	Refurbish existing seawall and maintain	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives	Continued Refurbishment of existing seawall and maintain	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives
3b	W13	Maintain access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain access and H&S compliance	No change or deterioration of WFD Objectives	-	Maintain access and H&S compliance	No change or deterioration of WFD Objectives	-
3b	W14	Maintain	No change or deterioration of WFD Objectives	-	Environmental mitigation / habitat creation	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives	Do Nothing and Maintenance	No change or deterioration of WFD Objectives	-
3a	W15	Setback temporary flood barriers. Maintenance elsewhere	No change or deterioration of WFD Objectives	-	Setback temporary flood barriers. Maintenance elsewhere	No change or deterioration of WFD Objectives	-	Upgrade existing and implement new defences	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives
3a	W16	Setback temporary flood barriers. Maintenance elsewhere	No change or deterioration of WFD Objectives	-	Setback temporary flood barriers. Maintenance elsewhere	No change or deterioration of WFD Objectives	-	Upgrade existing and implement new defences	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives
3a	W17	Maintain	No change or deterioration of WFD Objectives	-	Maintenance /refurbishment	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	-	Maintenance	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	-
4	W18	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-
	W19	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-
	W20	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-
5	21	Do Minimum, with community led adaption	No change or deterioration of WFD Objectives	-	Do Minimum, with community led adaption	No change or deterioration of WFD Objectives	-	Adaptation	No change or deterioration of WFD Objectives	-
	22	Do Minimum (Maintain access and H&S)	No change or deterioration of WFD Objectives	-	Do Minimum (Maintain access and H&S)	No change or deterioration of WFD Objectives	-	Do Minimum (Maintain access and H&S)	No change or deterioration of WFD Objectives	-
	23	Maintain	No change or deterioration of WFD Objectives	-	Maintain and refurbish / upgrade	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives	Maintain and refurbish / upgrade	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives
6	24	PLP for residential properties at most risk and redevelopment.	No change or deterioration of WFD Objectives		PLP for residential properties at most risk and redevelopment	No change or deterioration of WFD Objectives	-	Upgrade / new defences and Redevelopment	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives

SMZ	PU	2015			2025			2055		
		Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion	Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion	Preferred Option	Preliminary Assessment Conclusion	Detailed Assessment Conclusion
	25	Temporary flood barriers and PLP for areas at most risk and redevelopment	No change or deterioration of WFD Objectives		Temporary flood barriers and PLP for areas at most risk and redevelopment	No change or deterioration of WFD Objectives	-	Upgrade / new defences and Redevelopment	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives
	26	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-
	27	No publically funded defence improvements	No change or deterioration of WFD Objectives	-	No publically funded defence improvements	No change or deterioration of WFD Objectives	-	No publically funded defence improvements	No change or deterioration of WFD Objectives	-
	28	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-
	29	Maintenance, minor PLP and Redevelopment	No change or deterioration of WFD Objectives	-	Maintenance, minor PLP, refurbishment and Redevelopment	No change or deterioration of WFD Objectives		Maintenance, minor PLP, refurbishment and Redevelopment	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives
	30	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-
	31	Temporary flood barriers and PLP for areas at most risk and redevelopment	Work within existing footprint - No change or deterioration of WFD Objectives	PLP, temporary flood barriers & flood warning system	Temporary flood barriers and PLP for areas at most risk and redevelopment	No change or deterioration of WFD Objectives	-	Upgrade / new defences and Redevelopment	Reduce morphological and ecological diversity - Possible failure of WFD2 objective	Work within existing footprint - No change or deterioration of WFD Objectives
	32	Do Minimum	No change or deterioration of WFD Objectives	-	Do minimum transferring to Do Nothing, with only Health and Safety actions where appropriate	No change or deterioration of WFD Objectives	-	Do Nothing	No change or deterioration of WFD Objectives	-