CAPITA | AECOM

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

West Wight Coastal Flood and Erosion Risk Management Strategy

Appendix G - Environmental Report

November 2016




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 Strategic Environmental Assessment (SEA) is required in order to determine the environmental impacts which may arise as a result of the implementation of the Strategy. This document, the SEA Environmental Report, informs the long-term Strategy through the identification of the likely significant effects of the implementation of the Strategy on relevant environmental receptors.

Document history

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2	Update following client comments	December 2015	Ben Taylor – Graduate Coastal Engineer	Jonathan Short – Senior Coastal Specialist	Tara-Leigh McVey - Associate
3	Update for consultation	March 2016	Ben Taylor – Assistant Coastal Engineer	Jonathan Short – Principal Consultant	Tara-Leigh McVey - Associate
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The methodology adopted and the sources of information used by URS / Capita in providing its services are outlined in this Report. The work described in this Report was undertaken between December 2014 and August 2015 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances.

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ACRONYM	MEANING
AONB	Area of Outstanding Natural Beauty
BAP	Biodiversity Action Plan
CAMS	Catchment Abstraction Management Strategy
CCMA	Coastal Change Management Area
CFMP	Catchment Flood Management Plan
CLG	Communities and Local Government
CRoW	Countryside and Rights of Way
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EC	European Community
EEC	European Economic Community
EH	English Heritage
FDGiA	Flood Defence Grant in Aid
FRMP	Flood Risk Management Plan
HEAP	Historic Environment Action Plan
HRA	Habitats Regulations Assessment
IDB	Internal Drainage Board
LGAP	Local Geodiversity Action Plan
LLFA	Lead Local Food Authority
LNR	Local Nature Reserve
LPRG	Large Project Review Group
NE	Natural England
NERC	The Natural Environment and Rural Communities
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
ODU	Option Development Unit
PDZ	Policy Development Zone
PLP	Property Level Protection
pSPA	Proposed Special Protected Area
RBMP	River Basin Management Plan
rMCZ	Recommended Marine Conservation Zone
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SI	Statutory Instrument
SINC	Site of Importance for Nature Conservation
SM	Scheduled Monument
SMP	Shoreline Management Plan
SMZ	Strategy Management Zone
SoP	Standard of Protection
SPA	Special Protected Area
SSSI	Site of Special Scientific Interest

ACRONYM	MEANING
SuDS	Sustainable Urban Drainage Systems
WFD	Water Framework Directive

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Non-Technical Summary

Background

The Isle of Wight Council is developing a Coastal Flood and Erosion Risk Management Strategy for 'West Wight', which extends in a clockwise direction from Freshwater Bay to East Cowes.

Ultimately, The Strategy provides an assessment of the risks and opportunities associated with coastal processes and presents the preferred management options to reduce the risks in a sustainable manner in the short (10 year), medium (10 -40 years) and longer term (40 – 100 years). The Strategy considers the effects of climate change, examining the impacts of sea-level rise and coastal erosion. In doing so, the Strategy forms an important element of the coastal management plan hierarchy and also provides guidance for spatial planning within the coastal zone.

Strategic Environmental Assessment

A Strategic Environmental Assessment (SEA) is undertaken to identify the significant effects that plans, programmes and strategies may have on the environment. The SEA framework therefore increases the consideration of environmental issues in decision-making processes and planning. The application of the SEA process to flood management plans and programmes is not legally required in every case, however adopting the SEA approach is strongly encouraged by the Department for Environment, Food and Rural Affairs (Defra) to enable a strategic approach to managing flood risk.

A Scoping Report preceded this Environmental Report. During the scoping phase, the environmental baseline of West Wight was determined. Subsequently, the environmental impacts (both adverse and beneficial) which may arise from the implementation of the Strategy were identified. A range of receptors were considered including: biodiversity, cultural heritage, human health, material assets, geology and soil, landscape and water. Topics scoped out of the report included; air, population and climate change, for the following reasons:

Air was scoped out of the assessment due to the fact that Strategy objectives and/or measures were not envisaged to give rise to activities which emit greenhouse gases or pollutants. If specific measures or actions are proposed which may have an impact upon air quality, additional assessments would be required beyond the scope of an SEA. Similarly, 'population' was scoped out as whilst there is the potential for some individuals to be affected by the implementation of the Strategy it is unlikely that the wider population will be significantly affected. Whilst climate change significantly impacts upon the coastal environment and is a function of sea-level rise, the Strategy and its associated objectives and measures are not envisaged to affect climatic change.

Effects relating to the topic areas that are linked to population such as flood risk, human health, and material assets have been scoped in to this assessment.

The Scoping Report was subject to statutory consultation with the Environment Agency (EA), Natural England (NE), and English Heritage (EH). The report was also distributed internally at the Isle of Wight Council. Comments and recommendations on the Scoping Report from statutory consultees have been acknowledged and addressed in this Environment Report. Further consultation will commence upon the Environmental Report alongside the Strategy.

The Environmental Report documents the SEA process, the environmental baseline, associated legislation and policy, the consultation responses and conducts an assessment of Strategy options against the baseline determined within the SEA Scoping Report (as reproduced within this Environmental Report), in order to determine the effects of the Strategy upon the environment.

West Wight Coastal Flood and Erosion Risk Management Strategy

Capita AECOM was commissioned by the Isle of Wight Council to develop a long-term Coastal Flood and Erosion Risk Management Strategy.

The Strategy provides an assessment of the risks and opportunities associated with coastal processes and develops a management framework to reduce and capitalise on these risks and opportunities respectively in a sustainable manner. In doing so, the Strategy forms an important element of policy for flood and coastal management and also provides guidance for spatial planning within the coastal zone. The SEA process, culminating in the preparation of an Environmental Report, formed an integral part of the wider option development and appraisal process, informing the preferred long-term strategy through its identification of the likely significant effects of the implementation of the Strategy on relevant environmental receptors.

The main stages of the Strategy development included:
- An assessment of the conditions and performance of existing coastal defences for the study frontage for the next 100 years;
- Development and evaluation of the options for the maintenance and improvement of defences, based on careful consideration of all technical issues, economics, stakeholder interests, future developments and environmental impacts; and,
- Recommendation of a preferred long-term strategy to be adopted.

Assessment Results

In order to measure the likely environmental impacts of implementing the Strategy upon the environment, Strategy options (both preferred and alternative options) were assessed against the environmental baseline determined within the SEA Scoping Report (as reproduced within this Environmental Report).

This SEA has identified that whilst there are some minor adverse impacts anticipated as a result of the implementation of the Strategy, these impacts are not significant. Additionally, where minor adverse impacts are apparent, both mitigation and monitoring measures have been recommended to prevent such impacts from occurring and to ensure the options put forward are sustainable. Generally, the preferred option facilitates a number of minor benefits to the study area with a number of significant benefits being facilitated in regards to environmental receptors such as human health, material assets and biodiversity.

The benefits of implementing the Strategy are perhaps best demonstrated by the ‘Do Nothing’ alternative assessment presented for each SMZ (bar SMZ1 and SMZ4 wherein the preferred option is in fact ‘Do Nothing’ in alignment with SMP requirements).

Under a ‘Do Nothing’ scenario in the short term, local communities, assets and infrastructure would be at an increased risk of flooding. In the longer-term it is likely that this risk would heighten over time as a result of climate change and associated impacts upon flood frequency and magnitude.

In conclusion, the preferred options and Strategy are unlikely to result in significant adverse impacts. Minor, beneficial impacts are likely with the opportunity for significant benefits to be delivered. Should all mitigation measures be followed, it would ensure potential detrimental environmental impacts would be avoided. Finally, the majority of the preferred options for each strategic management zone (as derived through cost-benefit analyses) align with the environmentally preferred option identified within this Environmental Report.

1. Introduction

1.1 Context and Study Area

The Isle of Wight is the largest island within the UK and sits off the coast of Hampshire in the south of England. The Island covers an area of 380.73km^2 (147 square miles), with a coastline of approximately 168km (104 miles) including estuaries.

The Isle of Wight Council is developing a Coastal Flood and Erosion Risk Management Strategy for 'West Wight', which extends from Freshwater Bay to East Cowes. This project frontage comprises the Isle of Wight Shoreline Management Plan (2011) [1] Policy Development Zones (PDZs) 6, 7 and 1 (running clockwise from west to east). PDZs 6, 7, and 1 are shown below in Figure 1-1. The Shoreline Management Plan which the Strategy sits under presents the high level policy framework for coastal management in this area.

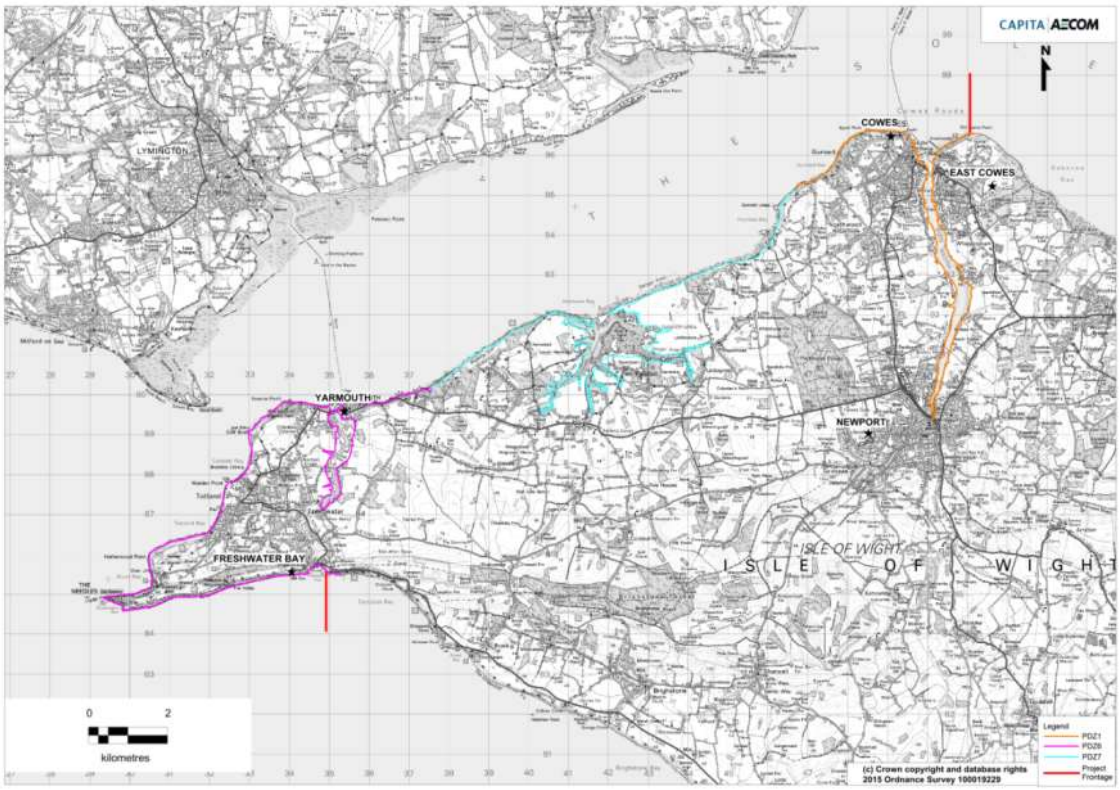

Figure 1-1: PDZ Locations.

PDZ 6: West Wight (from the eastern margin of Freshwater 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).

1.1.1 The Strategy

1 Isle of Wight Shoreline Management Plan (2011) http://www.coastalwight.gov.uk/smp/

The purpose of developing a Coastal Flood and Erosion Risk Management Strategy (herein the 'Strategy') is to outline the measures and actions which shall be undertaken to protect and enhance the coastline and its assets in both the short, medium and long term.

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 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.

As part of the development of the Strategy, a Strategic Environmental Assessment (SEA) is required in order to determine the environmental impacts which may arise as a result of the implementation of the Strategy. This document, the SEA Environmental Report, informs the long-term Strategy through the identification of the likely significant effects of the implementation of the Strategy on relevant environmental receptors and increases the consideration of wider environmental issues into both planning and decision-making processes.

1.2 The Role of Strategic Environmental Assessment and the Environmental Report

Article 1 of the European Directive (2001/42/EC) on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive) states that the preparation of an SEA will 'provide for a high-level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development'[2]. More simply a SEA is undertaken to identify the significant impacts that plans, programmes and strategies may have on the existing and future environment, and therefore heightens the consideration of environmental issues in decision-making processes. The SEA process ensures that environmental considerations inform the development of objectives and measures of the Strategy, whilst mitigating against any adverse environmental impacts and highlighting areas of environmental and socioeconomic opportunity. Additionally the SEA process identifies how the Strategy can contribute to the achievement of wider environmental objectives, including Water Framework Directive (WFD) objectives[3].

The Environmental Report provides an audit trail for the Strategy's SEA. It sets out the framework for undertaking the Strategic Environmental Assessment for the project together with the scope of the assessment, evidence base and review of relevant plans, programmes and policies to inform the assessment. It also includes a discussion of the likely significant effects of the implementation of The Strategy and recommendations are made in relation to ways in which to reduce likely adverse effects on the environment or enhance beneficial effects. The report includes proposals for relevant environmental indicators to monitor the effects of the implementation of The Strategy. This Environmental Report, where relevant, makes reference to the Habitats Regulations Assessment (HRA) Report which identifies any effects of The Strategy on internationally important wildlife sites. It also references the Water Framework Directive (WFD) Assessment which assesses

The SEA process is discussed in greater detail in Section 3.

2 SEA Directive (2001) http://ec.europa.eu/environment/eia/sea-legalcontext.htm

3 Water Framework Directive 2000 http://ec.europa.eu/environment/water/water-framework/index_en.html

2. Consultation

Stakeholder engagement is important in developing an acceptable Strategy which engages all parties. The SEA Directive imposes the following requirements for consultation:

- Authorities which, because of their environmental responsibilities, are likely to be concerned by the effects of implementing the plan or programme, must be consulted on the scope and level of detail of the information to be included in the Environmental Report. These authorities are designated in the SEA Regulations as the Consultation Bodies for England and Wales;
- The public and the Consultation Bodies must be consulted on the draft plan or programme and the Environmental Report, and must be given an early and effective opportunity within appropriate time frames to express their opinions;
- Other EU Member States must be consulted if the plan or programme is likely to have significant effects on the environment in their territories; and,
- The Consultation Bodies must also be consulted on screening determinations on whether an SEA is needed for plans or programmes.

As is the case with the Isle of Wight Coastal Strategy, local flood risk management strategies, plans and programmes may require a statutory SEA as recommended by the Department for Environment, Food and Rural Affairs (Defra). Acknowledging the above requirements, the SEA scoping report was consulted upon by the following statutory bodies:

- The Environment Agency (EA);
- English Heritage (EH); and,
- Natural England (NE).

The consultation period lasted for a duration of 5 weeks ending the 2nd March 2015. The Scoping Report was also circulated internally within the Isle of Wight Council. It should be noted that comments were not received from English Heritage.

Comments and recommendations on the Scoping Report from statutory consultees have been acknowledged and addressed in this Environment Report.

Further consultation took place upon the Environmental Report alongside the Draft Strategy, as detailed in Appendix E, which informed the Final Strategy and Appendices.

2.1 Development from the Scoping Report

Consultation responses were received from statutory consultees and where possible every effort has been made to incorporate these comments into the Environmental Report. Appendix A provides a detailed review of the consultation feedback and the subsequent amendments and additions made. The relevant portions of the Scoping Report baseline and context review have been reproduced herein and updated where necessary.

3. Strategic Environmental Assessment

3.1 The Purpose of Strategic Environmental Assessment

A SEA is an iterative, systematic, publicly accountable framework with an overarching aim of integrating environmental considerations within policy development at the earliest opportunity whilst providing an 'audit trail' of option development and environmental mitigation.

A SEA involves the systematic identification and evaluation of the potential environmental impacts resulting from the implementation of high-level decision-making (e.g. a plan, programme or strategy). By addressing strategic level issues, the SEA aids the selection of the preferred options, directs individual schemes towards the most environmentally appropriate solutions and locations and helps to ensure that resulting schemes comply with legislation and other environmental requirements. Impacts should not just be considered on a direct basis but should encompass temporary, permanent, positive, negative, secondary, cumulative and synergistic impacts over a range of timescales and probabilities.

The SEA Directive is transposed into UK law through the following:

- The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No.1633);
- The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (Statutory Rule 2004 No. 280);
- The Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004 (Scottish Statutory Instrument 2004 No. 258), and,
- The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 (Welsh Statutory Instrument 2004 No. 1656 (W.170)).

The methodology for undertaking this assessment will follow Communities and Local Government's (CLG) Guidance on SEA[4].

3.2 Stages in the SEA Process

The CLG Guidance on SEA identifies five key stages in the SEA process as set out in Figure 3-1.

The stages below are intended to be valid for all plans and programmes to which the Directive implies, irrespective of their geographical scope. Stage A and the associated tasks were carried out in the Isle of Wight Strategy SEA Scoping Report. This Environmental Report documents Stages B and C of the process, then was updated following Stage D, wherein both the draft Strategy and Environmental Report underwent consultation and the feedback from such consultation was used to finalise the Strategy. Stage E 'Implementation and Monitoring' will occur over the lifetime of the Strategy in order to ensure continual improvement.

4 CGL Guidance on SEA https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf

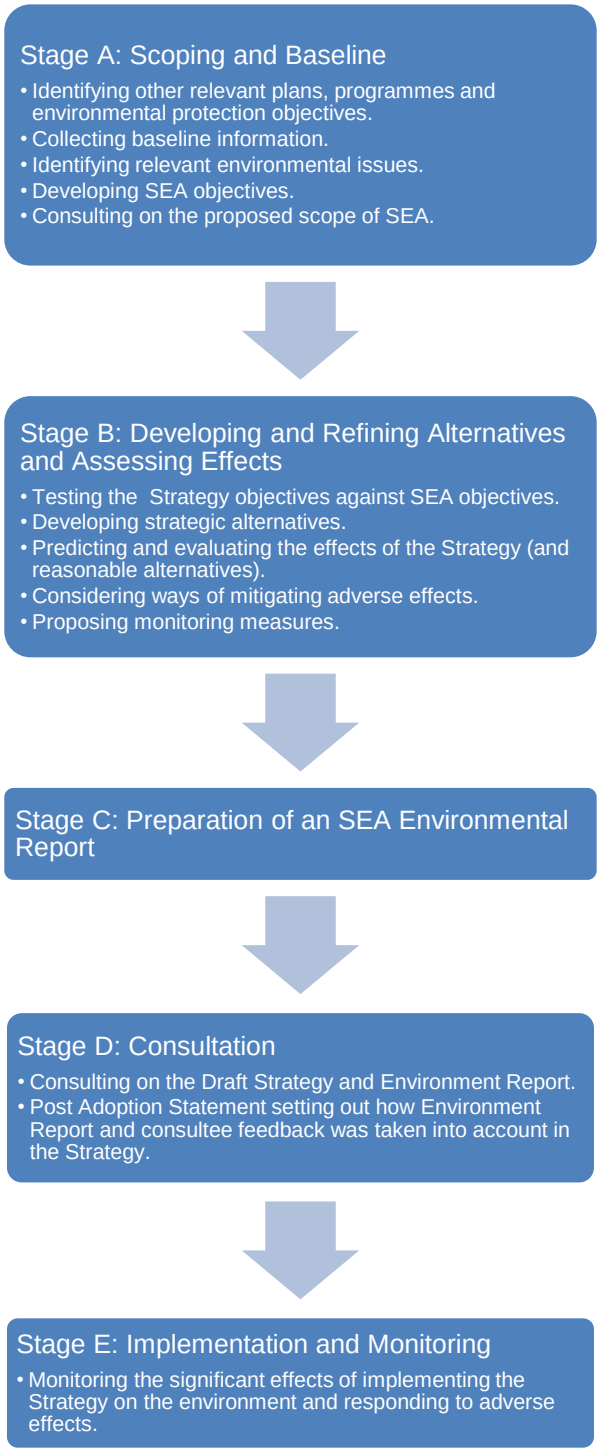

Figure 3-1: Relationship between Stages of the SEA Process (Based on CLG Guidance 2006)

3.3 Compliance with SEA Regulations

The SEA Directive lists the content that is required in an Environment Report (Annex I). These requirements along with how they have been met by this Environmental Report are listed below in Table 3-1:

Table 3-1: SEA Environmental Report Requirements

Environmental Report Requirements	Report Section
(a) an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;	- Table of Contents - Section 3 - Section 6 - Appendix B - Sections 9-15
(b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	- Sections 9-15
(c) the environmental characteristics of areas likely to be significantly affected;	- Sections 9-15 - Section 3
(d) any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC (The Birds Directive) and 92/43/EEC (The Habitats Directive);	- Sections 9-15 - Section 3
(e) the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;	- Appendix B - Sections 9-15
(f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;	- Sections 7-15
(g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	- Sections 9-15
(h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	- Section 7
(i) a description of the measures envisaged concerning monitoring in accordance with Article 10;	- Sections 9-15
(j) a non-technical summary of the information provided under the above headings.	- Non-technical Summary

3.4 Dealing with Uncertainties

As noted within the SEA Directive:

'An SEA need not be done in any more detail, or using any more resources, than is useful for its purpose. The Directive requires consideration of the significant environmental effects of the plan or programme, and of reasonable alternatives that take into account the objectives and the geographical scope of the plan or programme'.

It is not often deemed appropriate or practicable to predict the effects of an individual project-level proposal in the degree of detail that would normally be required for an EIA within the bounds of an SEA. The objectives of the SEA and the Strategy itself are high-level and the Strategy does not include proposals or detail of site specific measures for management of local flood risk that can be assessed within the SEA. Whilst uncertainty remains, a certain level of detail is known and is referred to where appropriate within this Environmental Report.

Due to uncertainty, the SEA will provide an assessment at a level of detail that is commensurate with the nature of the Strategy objectives, which recognises the uncertainty in spatial and technical scope and hence considers generically how the Strategy could lead to options and activities which in turn lead to significant environmental effects.

3.5 Scope of the SEA

The SEA Regulations require the assessment of the likely significant environmental effects of the plan or programme on receptors such as:

- Air;
- Biodiversity;
- Climate;
- Cultural Heritage;
- Human Health;
- Landscape;
- Material Assets;
- Population;
- Geology and Soil;
- Water; and,
- The interrelationships between the above factors.

The purpose of the Scoping stage of the SEA is to identify environmental receptors that are likely to be significantly affected by, or could influence options of, The Strategy. The SEA Regulations outline aspects of the environment that must be considered. However, if there are unlikely to be any significant effects upon a particular receptor it is possible to scope it out of the assessment.

One of the issues identified in the SEA Regulations is climatic factors and this is taken to refer to the potential effects of the implementation of the Strategy on the climate. Given that flood risk and coastal processes are driven by the climate rather than having an effect on the climate, the Scoping Report considered the topic to not be relevant to the issues relating to the Strategy and was therefore scoped out of the assessment. The potential effects of climate change such as extreme weather and flooding will be addressed under the appropriate topic headings, such as material assets and water.

The following SEA topics were also considered unlikely to be significantly affected by the Strategy and it was therefore proposed that they were scoped out of the SEA.

Population - Although there is the potential for some individuals to be affected by the implementation of the Strategy it is unlikely that the wider population will be significantly directly affected. Effects relating to topic areas that are linked to population, such as flood risk, human health and material assets have been scoped in to this assessment.

Air - The Strategy does not yet include objectives or measures that are envisaged to give rise to activities that emit greenhouse gases or other pollutants. The effects upon air quality have therefore been excluded. However, if specific measures or plans are proposed which may have an adverse impact upon air quality, further assessments may be required.

Climate Change – Whilst climate change significantly impacts upon the coastal environment and is a function of sea-level rise, the Strategy and its associated objectives and measures are not envisaged to affect climatic change.

Therefore the following receptors were 'scoped in' to the SEA assessment:
- Biodiversity;
- Cultural heritage;
- Human health;
- Landscape;
- Material assets;
- Geology and soil;
- Water; and,
- The interrelationship between the above factors.

3.6 Related Plans and Programmes

Consideration of the context in which the Strategy is being prepared involves two steps. Firstly, related Plans and Programmes considered relevant to the Strategy must be identified. Secondly these must be reviewed with the aim of establishing their implications for the Strategy and SEA (e.g. the opportunities they create or the constraints they present).

For practical reasons the identification of plans and programmes cannot result in an exhaustive or definitive list. The number of plans and programmes has been limited to the plans that are most representative and relevant to the topic area and the implementation of the Strategy to provide an overview of the objectives and targets that are most likely to influence the development of the Strategy. Appendix B comprises a comprehensive policy context review which considers relevant plans and programmes at the international, national, regional and local level. A brief discussion of the most relevant plans and programmes is included in each of the topic chapters.

3.7 Environmental Baseline

The collection of baseline information forms an essential part of the SEA process. It is important to obtain sufficient baseline information on the current and likely future state of the environment in order to enable the Strategy's effects to be adequately predicted and evaluated. Where possible data should be collected which is able to show either a spatial or temporal trend.

3.8 SEA Framework

The output of the Scoping process is a SEA Framework which is comprised of the identified environmental issues and potential indicators to measure the effects of the implementation of the Strategy on environmental receptors. The framework provides a means by which the environmental effects of the Strategy can be assessed and has been derived from the key environmental issues identified for the area and the key environmental objectives identified in the policy review. Table 3-2 outlines each SEA topic the key environmental issues identified within this SEA Scoping Report and associated potential indicators.

Table 3-2: SEA Key Environmental Issues and potential indicators		
SEA Topic	**Key Environmental Issue**	**Potential Indicator**
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc. - By 2100 it is projected that between 58-75% of existing saltmarsh will be lost; - These threats will be exacerbated by climate change; - There are a number of management plans, programmes and policies which have the aim of protecting and enhancing the Isle of Wight biodiversity; and, - The implementation of the coastal Strategy is likely to offer protection to designated sites and prevent their inundation/erosion and complement the suite of flood and water management resources which are already available.	- Condition and extent of designated sites - Area of habitat enhanced as a result of flood reduction measures - Negative impacts on the condition and/or integrity of statutory and non-statutory ecological sites as a result of flooding.
Cultural Heritage/Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures; - The integrity of heritage assets is likely to be maintained through various policy measures such as the Isle of Wight Core Strategy which ensures the protection of the historic environment in regard to new development; and, - Flood and water management plans programmes and strategies such as the Coastal Strategy are likely to contribute to the protection of heritage assets through a reduced incidence of flooding and associated impacts such as weathering and erosion.	- Number/area of designated heritage assets at risk of local flooding - Number/area of Conservation Areas which have changed as a result of the Strategy - Number of listed buildings on the ‘at risk’ register at risk from flooding.

Table 3-2: SEA Key Environmental Issues and potential indicators		
SEA Topic	**Key Environmental Issue**	**Potential Indicator**
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the Isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate; - The development of a Coastal Strategy is likely to be beneficial in reducing coastal erosion and flooding and thereby protecting landscape assets; and, - The implementation of shoreline management measures such as sea defences may adversely impact upon the environment.	- Proportion of undeveloped coastline - Number/area of open spaces at significant risk of local flooding, identified using site specific surface water or ordinary watercourse flood modelling - Number of measures that include enhancements to open spaces and recreational areas - Area of enhanced landscape and green infrastructure as a result of flood reduction measures
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding and erosion can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety; - Flooding can limit access to healthcare; and, - Flood alleviation measures derived from the implementation of the Coastal Strategy have the potential to protect human health.	- Number of flood incidents reported - Number of properties / businesses at risk of flooding and erosion - Number of flood related injuries/fatalities - Number of measures located in areas with an above average number of elderly people or level of deprivation
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include	- Number of residential and non-residential properties at risk of flooding and/or erosion from local sources - Number/severity/duration of incidents leading to

Table 3-2: SEA Key Environmental Issues and potential indicators		
SEA Topic	**Key Environmental Issue**	**Potential Indicator**
	numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; - As a result of overtopping and breach, these coastal defences will require future management, - The purpose of the Strategy is to outline the measures and actions which shall be undertaken to protect and enhance the coastline and its assets in both the short, medium and long term, inclusive of climate change and associated impacts such as sea-level rise and coastal erosion; and, - As a result the Strategy is likely to indirectly protect West Wight's material assets through a reduction in flood risk.	unplanned disruption or damage to essential infrastructure and service provision - Number of SuDS schemes adopted into existing and future developments - Number of new developments permitted in areas of flood risk
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage; and,	- Area of agricultural land lost due to the need for flood defence - Area of county land falling under Environmental Stewardship agreements - Sedimentation rates from IDBs - Number of recorded pollution incidents

Table 3-2: SEA Key Environmental Issues and potential indicators		
SEA Topic	**Key Environmental Issue**	**Potential Indicator**
	- The main aim of the Strategy is to protect and enhance the coastline and associated assets therefore the Strategy is likely to minimise pressures on soil and geological assets.	
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation; - There are numerous incidents of historic flooding in areas such as Yarmouth, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site; and, - The coastal strategy joins a suite of resources which aim to protect and enhance the coastal and water environment and it is therefore likely that a number of potential adverse impacts will be mitigated and/or avoided by the suggested measures contained within the Strategy.	- Standard of coastal defence - WFD objectives achieved on watercourses where measures have been implemented - Consultation with the Environment Agency regarding ecological and chemical status of waterbodies

4. The West Wight Coastal Flood and Erosion Risk Management Strategy

4.1 Overview

The aim of the West Wight Coastal Flood and Erosion Risk Management Strategy (The Strategy) is to reduce risks to people and the developed and natural environment which occurs as a result of flooding and coastal erosion, through the development and implementation of a sustainable Strategy that encourages provision of technically, economically and environmentally sound defence measures.

The Strategy provides an assessment of the risks and opportunities associated with coastal processes and presents the preferred management options to reduce the risks in a sustainable manner in the short (10 year), medium (10 -40 years) and longer term (40 – 100 years). In doing so, the Strategy forms an important element of the coastal management hierarchy and also provides guidance for spatial planning within the coastal zone.

Key stages of the Strategy development included:

- An assessment of the conditions and performance of existing coastal defences for the study frontage for the next 100 years;
- The development and evaluation of options for the maintenance and improvement of defences, based on careful consideration of all technical issues, economics, stakeholder interests, future developments and environmental impacts; and,
- Recommendation of a preferred long-term strategy to be adopted.

4.2 Study Site

The study area (Figure 1-1) extends approximately 92km around the coast of the Isle of Wight from Freshwater Bay to East Cowes, as detailed below:

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

This site extends approximately 27km in length and includes the communities of Freshwater, Alum Bay, Totland, Colwell, Yarmouth and Port la Salle. The current approach to shoreline management in this area is mixed and the majority of the coastline is protected by nature conservation designations, largely comprising SSSIs and SACs.

PDZ 7: **North-west Coastline** (from the eastern margin of Bouldnor to the western margin of Gurnard Luck).

This frontage extends approximately 39km in length, inclusive of Newtown Estuary. This area includes the areas of Hamstead, Newtown Estuary and Thorness Bay and the current approach to shoreline management in this area is no active intervention. SAC and Ramsar sites cover the entirety of the coast.

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

This area comprises the communities of Gurnard, Cowes, East Cowes and surrounding the Medina Estuary. This frontage is approximately 26km in length, inclusive of the Estuary. The current approach to shoreline management is largely to ‘hold the existing defence line’ or ‘no active intervention’. The majority of the coastline is designated as a Special Area of Conservation (SAC) with Ramsar sites apparent within the estuary and Sites of Special Scientific Interest (SSSI) inland.

5. Sustainability Context

5.1 Introduction

Sustainability as defined by the Brundtland Report[5] is "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs" and encompasses social justice, environmental responsibility and economic viability. This section of the report includes an outline review of the relevant plans, programmes and policies that inform the SEA and the Strategy.

5.2 Review of related plans, programmes and strategies

The SEA Directive requires that a SEA includes information on the relationship of the Strategy with other relevant policies, plans and programmes (Annex I (a)), as well as environmental protection legislation at international, national and local levels.

A review of relevant documents has been undertaken in order to identify any potential inconsistencies or constraints between these documents and the Strategy and to identify opportunities for environmental enhancement. Appendix B provides an inventory of the reviewed documents which were considered to have a bearing on the objectives of the Strategy and those which were used to scope and feed the development of the SEA.

Legislation and guidance of particular relevance is listed below:

International

- EU Floods Directive (2007/60/EC)[6] on the assessment and management of flood risks;
- EU Water Framework Directive (2000/60/EC);
- The Habitats Directive (92/43/EEC)[7]; and,
- The Birds Directive 2009/147/EC (codified version of 79/409/EEC)[8];

National

- Flood Risk Regulations (2009) (SI 3042);
- Flood and Water Management Act (2010);
- National Flood and Coastal Erosion Risk Management Strategy for England (2011);
- Future Water – The Government's Water Strategy for England (Defra, 2008)[9];
- Water Act 2003[10];
- National Infrastructure Plan (2010)[11];
- The Wildlife & Countryside Act (1981) as amended (most notably by the Countryside and Rights of Way (CRoW) Act[12] (2000);

5 Brundtland Report 1987 http://conspect.nl/pdf/Our_Common_Future-Brundtland_Report_1987.pdf

6 EU Floods Directive (2007/60/EC) http://ec.europa.eu/environment/water/flood_risk/index.htm

7 Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna accessible via: http://ec.europa.eu/environment/nature/legislation/habitatsdirective/

8 Council Directive 2009/147/EC on the conservation of wild birds (codified version of 79/409/EEC) accessible via: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF

9 Future Waterhttp://www.official-documents.gov.uk/document/cm73/7319/7319.pdf?bcsi_scan_AB11CAA0E2721250=0&bcsi_scan_filename=7319.pdf

10 Water Act http://www.legislation.gov.uk/ukpga/2003/37/contents

11 HM Treasury, 2010: National Infrastructure Plan. Available at: http://www.hm-treasury.gov.uk/ppp_national_infrastructure_plan.htm

12 Wildlife and Countryside Act http://www.jncc.gov.uk/page-1377

- National Planning Policy Framework (2012);
- Securing the Future: UK Government Sustainable Development Strategy (2005)[13];
- UK Biodiversity Action Plan[14];
- National Heritage Protection Plan[15]; and,
- Conservation of Habitats and Species Regulations (2010)[16].

Regional and Local

- Isle of Wight Catchment Flood Management Plan (2009);
- South East River Basin District River Basin Management Plan (2009);
- South East River Basin Flood Risk Management Plan Scoping Report (2014);
- Isle of Wight Shoreline Management Plan 2 (2010);
- Isle of Wight North East Coastal Defence Strategy Study (2005);
- Island Plan (Local Development Framework, 2012).

5.3 Water Framework Directive (WFD) Assessment

The European Water Framework Directive (WFD) (2000/60/EC), which was transposed into UK law in 2003 by the Water Environment (WFD) (England and Wales) Regulations, represents a strategic planning process to manage, protect and enhance the condition of water bodies. It establishes a framework for the protection of water bodies including terrestrial ecosystems and wetlands directly dependent on them.

Plans and strategies which could influence water body condition should consider WFD objectives. A WFD assessment has been undertaken alongside the production of this Environmental Report.

5.4 Identification of Key Themes

The main themes and objectives from the policies, plans and programmes that are considered relevant to the Strategy (as outlined above) are presented below:

- Reduce and manage the risks of flooding;
- Adapt and mitigate the impacts of climate change;
- Promote a strong and diverse economy;
- Promote sustainable, healthy and safe communities;
- Protect and enhance the quality, extent and character of open and green spaces, natural environments and waterways;
- Conserve flora and fauna and their habitats;
- Halt overall biodiversity loss;
- Improve water quality so all Heavily Modified water bodies achieve 'Good Ecological Potential' as set out in the WFD;
- Provide an efficient, effective and robust transport system;
- Protect cultural, architectural and archaeological heritage assets including conservation areas and built heritage; and,
- Promote sustainable growth.

The themes and objectives identified will provide an input into the process of identifying key issues and opportunities in the development and refinement of the SEA objectives.

13 Securing the Future https://www.gov.uk/government/publications/securing-the-future-delivering-uk-sustainable-development-strategy

14 UK Biodiversity Action Plan http://jncc.defra.gov.uk/default.aspx?page=5155

15 National Heritage Protection Plan http://www.english-heritage.org.uk/professional/protection/national-heritage-protection-plan/

16 Conservation of Habitats and Species Regulations (2010) http://www.legislation.gov.uk/uksi/2010/490/contents/made

6. Overview of the Strategy Development and Integration of the SEA Process

6.1 Overview of the Strategy Development Process

The key steps involved in The Strategy development are outlined in Figure 6-1. The interface of the SEA with the Strategy development process is provided in Table 6-1 and is described in further detail below.

The SEA process, culminating in the preparation of this Environmental Report, has informed the preferred long-term Strategy through identification of the likely significant effects of the implementation of the Strategy on relevant environmental receptors. For instance if an objective from the Strategy did not correspond with and facilitate the delivery of an SEA objective such as the protection of human health and wellbeing, the SEA process would put forward recommendations to ensure human health did not suffer adversely as a result of implementing the Strategy. Where possible, impacts of a beneficial nature will also be facilitated.

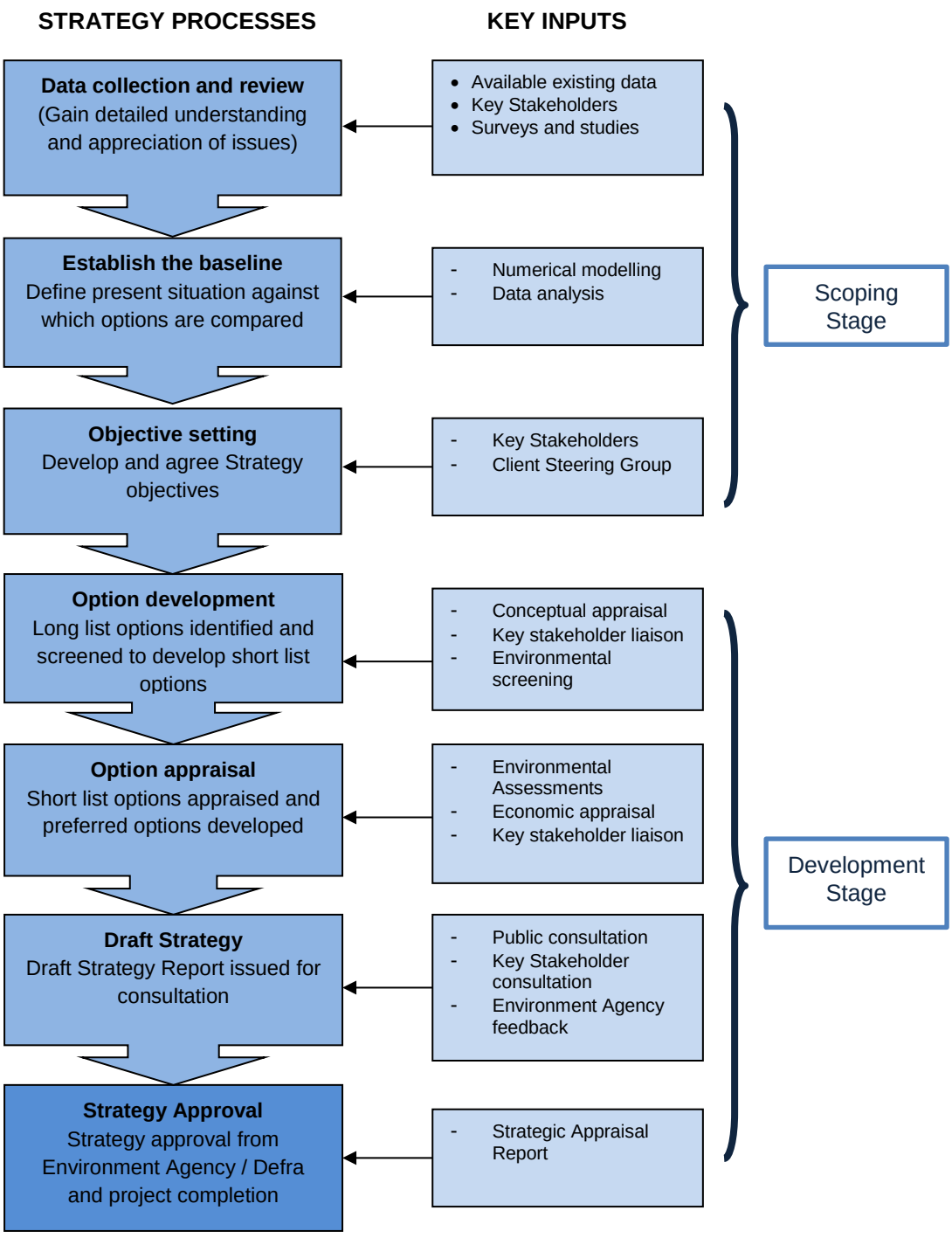

Figure 6-1– Summary of the Isle of Wight Coastal Flood and Erosion Risk Management Strategy Development Process.

Table 6-1: Strategy Development and the SEA Interface		
	SEA	**Coastal Strategy Study**
Stage A	**Scoping Stage** - Setting the context and develop SEA objectives - Establishing the baseline - Deciding on the scope	**Data collection and review** - Establishing the baseline - Condition and effective life of existing defences - Surveys and modelling **Establishing the Baseline** **Setting the objectives**
Stage B	**Appraisal of alternatives and effects** - Test Plan against objectives - Develop alternatives and consider effects	**Option development and appraisal** - Developing and appraising the options - Stakeholder consultation - Technical and Environmental Assessment - Evaluate options for maintenance and improvement of defences and their impacts
Stage C	**Preparing the environmental report**	**The Draft Strategy**
Stage D	**Consultation on the draft report and preparation of final report**	**Strategy Approval and Strategy Appraisal Report**
Stage E	**Monitoring and implementation of the plan**	

6.2 Establish the baseline

In order to develop the Strategy it was imperative to understand the present situation and current environmental baseline. A baseline can be defined as an existing condition or situation against which options or scenarios are compared. Specifically relating to the Strategy, the baseline is often considered to mean a 'Do Nothing' Scenario. A 'Do Nothing' scenario is defined as *'Where there is no further intervention of any kind, including no emergency response or warning system. Where there are assets at present or where maintenance activities or other interventions are carried out, the option will be to withdraw all activities, allowing nature to take its course'.* In essence, the 'Do Nothing' scenario represents a hypothetical situation whereby all existing defences are abandoned in terms of maintenance and repair, and no remedial or additional protection works are carried out. In addition, adaptation to sea level rise or other climate change responses are not addressed.

Through determining the present and future flood and erosion risks under a 'Do nothing' scenario, the properties, features, assets and key infrastructure that are in need of protection over the next 100 years were identified though tidal flood modelling. The strategy has subsequently valued these assets and developed preferred options to manage these risks strategically.
However, whilst using a 'Do Nothing' approach as a baseline for economic analysis can be highly valuable, it is less valuable when considering the impacts which may arise as a result of

the implementation of the Strategy on environmental receptors. For instance, considering a 'Do Nothing' approach as an environmental baseline for cultural heritage may be detrimental in that it fails to acknowledge the adverse consequences such as heritage deterioration, damages and or loss as a result of erosion and/or weathering associated with sea level rise and coastal erosion. In addition, using a 'Do Nothing' as a baseline for ecology should be used with caution as a linear relationship is assumed. Coastal processes are dynamic and whilst flood alleviation and coastal erosion works may adversely affect nature conservation efforts initially they may ultimately provide greater habitat creation in the future.

The SEA scoping report provided an environmental baseline for the environmental receptors scoped in to this assessment.

6.3 Objective setting

Specific objectives and 'aspirations' for the Strategy were outlined and agreed by key stakeholders early in the development of the Strategy through extensive consultation. Similarly, throughout the development of the SEA Scoping Report a number of key environmental issues were identified for each environmental receptor scoped into the assessment. For instance, in the case of biodiversity a number of potential threats to internationally designated conservation areas were highlighted including coastal development and coastal squeeze, saltmarsh loss and *Spartina* dieback, climate change, and sea-level rise. These issues subsequently informed the development of Strategy objectives.

These proposed Strategy objectives formed an integral consideration in the identification and development of Strategy options.

A number of primary and secondary objectives were developed at the outset of the project. 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 FDGiA (Flood Defence Grant in Aid) 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.

6.4 Option Development

The development of options comprised a multi-staged, systematic process as outlined in Figure 6-2.

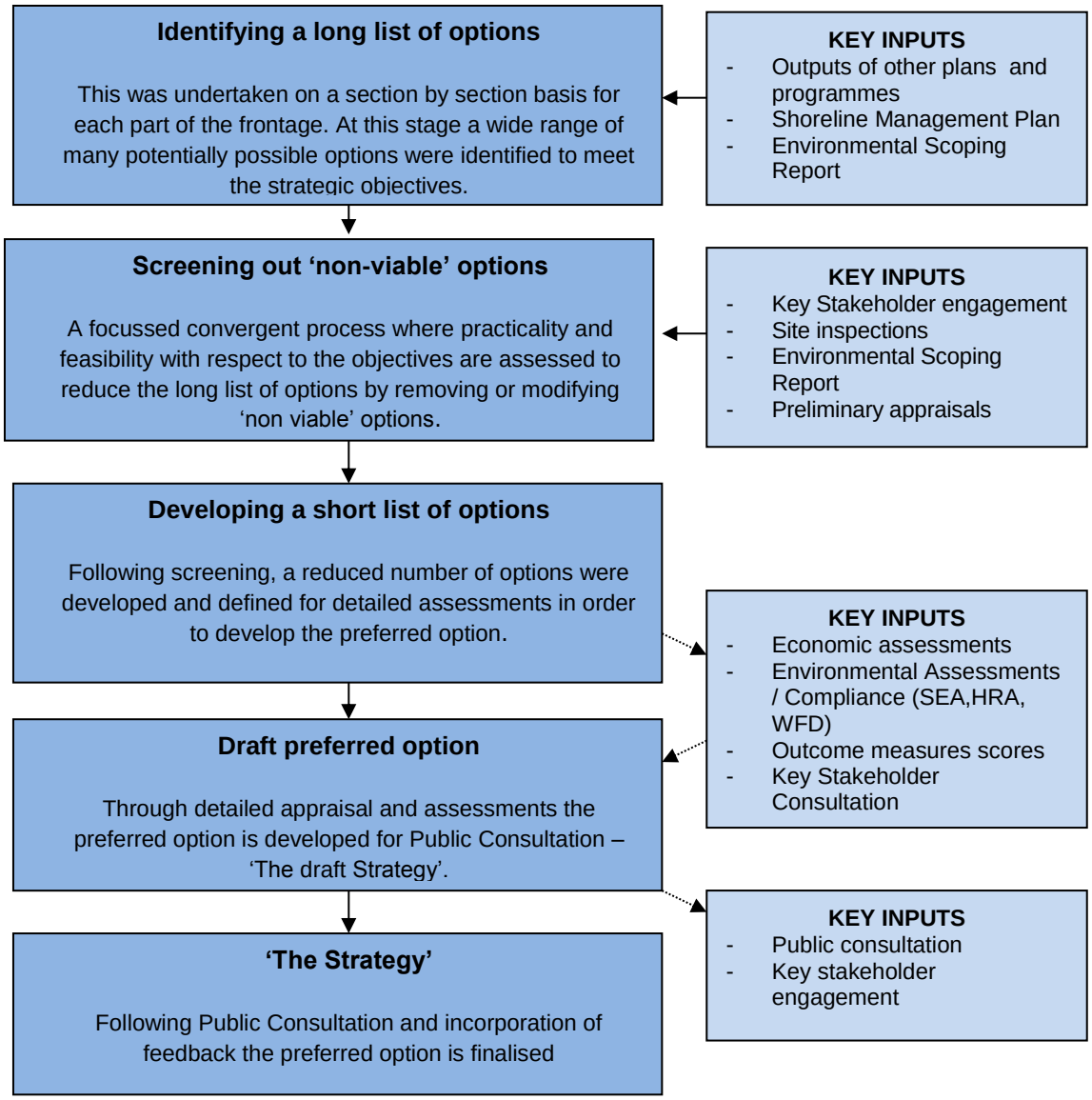

Figure 6-2: Option Development Process

Initially a wide range of possible options were identified (termed the long list options). These options were then screened to remove 'non-viable' options. This process was informed by the supporting technical and environmental studies, site visits and key stakeholder liaison. A 'short list' of potentially viable options was then developed for detailed technical, environmental and economic appraisal.

Throughout this process, communication and engagement with key stakeholders was paramount to ensure local knowledge, needs, constraints and aspirations are considered in order to develop feasible options, and explore potential funding sources.

6.5 Option Appraisal

The preferred options were selected through a detailed appraisal of options against a range of criteria.

Firstly, the options were appraised to ensure that they are technically feasible. Economic viability also needed to be demonstrated; however this did not necessarily justify selection of one option over another. Environmental appraisal was carried out through the SEA to demonstrate that the environmental impacts of the proposed options were acceptable.

Following the detailed assessments and testing, the preferred options, standards and phasing were recommended and the Strategy was drafted.

6.6 The Draft Strategy

Prior to the Strategy being finalised, a draft was be issued for 3 months of public consultation in Spring 2016. This provided stakeholders and members of the public with the opportunity to review the Strategy recommendations and to provide feedback. Stakeholder feedback and comments were addressed and incorporated in the final revision of the Strategy.

6.7 Strategy Approval

All coastal strategies are considered and approved by the Environment Agency's Large Project Review Group (LPRG).

A coastal strategy submission requires the completion of a Strategic Appraisal Report (StAR) along with other documentation generated in support of the Strategy. The StAR format provides a consistent reporting format for the LPRG to appraise, and is prescriptive in the level of detail required. Additional supporting evidence, including calculations, drawings, and additional reports are contained in Appendices to the Strategy.

Following public consultation and completion of the final revision of The Strategy, Capita-Aecom will develop the StAR document on behalf of the Isle of Wight Council, setting out the business case and apply for public funding for The Strategy. The StAR document along with the Strategy will then go the LPRG for consideration and final approval.

7. Appraisal of Strategic Options

7.1 Option Development

The option development process refers to the tasks involved to develop the preferred management options along the strategy frontage. The process followed the Environment Agency's National Flood and Coastal Erosion Risk Management guidelines.

7.2 Development of Option Development Units and Identifying Potential Local Measures

Flood and erosion risks, existing coastal defence types, land uses, land ownership and issues and opportunities vary significantly along the Strategy frontage. For effective flood and erosion risk management measures to be developed it is important to consider and recognise this local variability. With this in mind, the coastline was divided into small, sections known as Option Development Units (ODUs). These Units (W1-32 – West 1 to West 32) are shown in Table 7-1 and Figure 7-1.

Table 7-1: Option Development Units	
Option Development Unit	**Area**
W1	Freshwater Bay
W2	Tennyson Down, Alum Bay and Headon Warren
W3	Southern Totland Bay
W4	Northern Totland Bay
W5	Southern Colwell Bay
W6	Central Colwell Bay
W7	Fort Albert
W8	Fort Victoria Country Park
W9	Fort Victoria and Norton
W10	Norton Spit
W11	Western Yar Estuary - Western shore
W12	The Causeway
W13	Western Yar Estuary - Eastern shore
W14	Thorley Brook and Barnfields Stream
W15	Thorley Brook to Yar Bridge
W16	Yar Bridge to Yarmouth Common
W17	Yarmouth Common to Port la Salle
W18	Bouldnor Copse and Hamstead
W19	Newtown Estuary
W20	Thorness Bay and southern Gurnard Bay
W21	Gurnard Luck
W22	Gurnard Cliff
W23	Gurnard to Cowes Parade
W24	Cowes Town Centre to Fountain Yard
W25	Fountain Yard to Medina Wharf
W26	Kingston Road Power Station to Shrape Breakwater
W27	Shrape Breakwater to Old Castle Point
W28	Central Medina – north west
W29	West Medina Mills
W30	Central Medina – south west
W31	Newport Harbour
W32	Central Medina – east

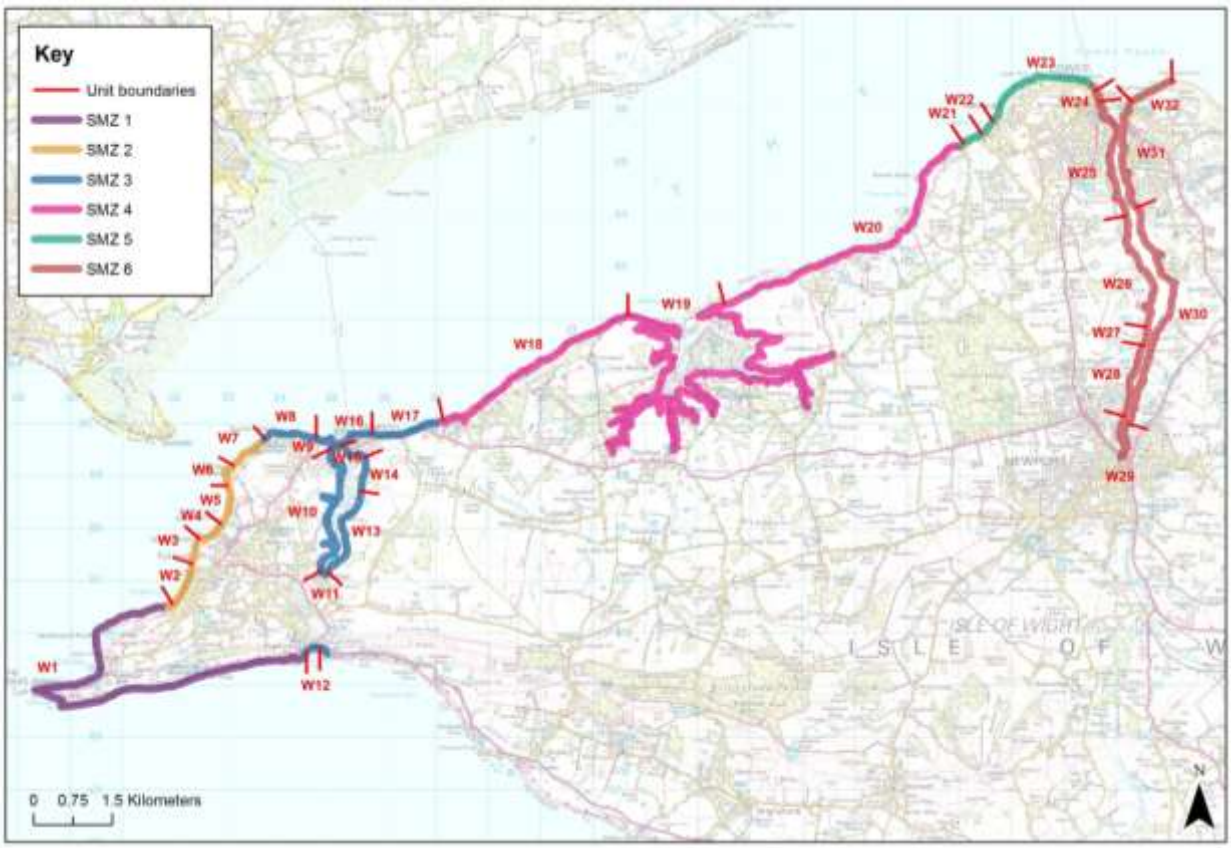

Figure 7-1: Option Development Units and Strategy Management Zones

7.3 Development of Strategy Management Zones

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 were grouped in 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 ODUs as shown in Table 7-2. A map of the SMZs is shown in Figure 7-1~~Figure 7-1~~.

Table 7-2: Strategy Management Zones and corresponding Option Development Units		
Strategy Management Zones	**Area Description**	**ODUs**
SMZ1: Needles Headland	Fort Redoubt to southern limit of Totland Bay	W1
SMZ2: Totland and Colwell Bays	Southern limit of Totland Bay to Fort Victoria	W2
		W3
		W4
		W5
		W6
		W7
SMZ3a: Yarmouth Coast (Fort Victoria across Yarmouth to Port la Salle)	Strategy Management Zone 3a (SMZ 3a) stretches between Fort Victoria and Port la Salle and includes Norton Spit and Yarmouth town to as far south as (but not including) Thorley Brook.	W8
		W9
		W15
		W16
		W17
SMZ3b: Western Yar Estuary	Strategy Management Zone 3b (SMZ 3b) covers the Western Yar Estuary to as far south as, but not including, the Causeway, and including Thorley Brook.	W10
		W13
		W14
SMZ3c: Freshwater (The Causeway and Freshwater Bay)	Strategy Management Zone 3c (SMZ 3c) covers the Causeway and Freshwater Bay and the Freshwater/Afton Marsh area in-between these locations.	W11
		W12
SMZ4: Newtown Coast	Bouldnor cliff to Thorness Bay	W18
		W19
		W20
SM5a: **Gurnard Luck and Gurnard Cliff**	Strategy Management Zone 5a (SMZ 5a) encompasses Gurnard Luck and Gurnard cliff.	W21
		W22
SMZ5b: Gurnard to Cowes Parade	Strategy Management Zone 5b (SMZ 5b) is located from Gurnard Bay (east of Gurnard cliff) around the headland to Cowes Parade.	W23
SMZ6a: Cowes and East Cowes	Strategy Management Zone 6a (SMZ 6a) includes the towns of Cowes and East Cowes.	W24
		W25
		W31
SMZ6b: Medina Estuary (and East Cowes outer Esplanade)	Strategy Management Zone 6b (SMZ 6b) includes both sides of the River Medina from the south of Cowes to the north of Newport, and also from the Shrape Breakwater, east of Cowes, to Old Castle Point.	W26
		W27
		W28
		W30
		W32
SMZ6C: Newport Harbour	Strategy Management Zone 6c (SMZ 6c) includes Newport Harbour and quay sides	W29

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

- PDZ6 → SMZs 1, 2 and 3
- PDZ7 → SMZ 4
- PDZ1 → SMZ 5 and 6

Strategic level options were subsequently developed for each SMZ which comprise packages of suitable local measures and actions within each Option Development Unit (Table 7.3).

Table 7.3 Strategic options appraised for each Strategy Management Zone (SMZ)			
SMZ / ODUs	**Area**	**Option**	**Description**
SMZ 1 W1	Needles Headland (Fort Redoubt to southern limit of Totland Bay)	Do Nothing	No active intervention. Baseline scenario
SMZ 2 W2 – W7	Totland and Colwell Bays (Southern limit of Totland Bay to Fort Victoria)	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	Maintain H&S and access as long as possible and develop coastal change management area plan (W2-W6).
		Maintain then Improve from 2025	Phased seawall improvement and cliff stabilisation. Maintain defences (W2-W4) until end of design life then implement phased cliff drainage and sea wall stabilisation works (for example a mass rock revetment). Do minimum elsewhere.
		Improve (now)	Seawall stabilisation works (for example a mass rock revetment) and cliff stabilisation and drainage now (W2-W4). Do minimum elsewhere.
SMZ 3a W8 – W9 W15 – W17	Yarmouth Coast (Fort Victoria to Port la Salle	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	H&S and access. Flood warning and emergency response plan.
		Maintain (and Temporary Flood Barriers) then Improve from 2055	Use Temporary Flood Barriers to manage and reduce flooding to areas at significant risk by sustaining a 1 in 75 year (1.33 % AEP) standard of protection. Prevent erosion to critical infrastructure serving the town and the West Wight. From 2055, if funding can be secured, raise / implement new defences (bunds and floodwalls) to manage long term increase in flood and erosion risk posed by sea level rise.
		Maintain (and PLP) then Improve from 2055	Use Property Level Protection to manage and reduce flooding to residential properties at very significant risk. Prevent erosion to critical infrastructure serving the town and the West Wight. From 2055, if funding can be secured, raise / implement new defences (bunds and floodwalls) to manage long term increase in flood and erosion risk posed by sea level rise.
		Improve (now)	Raise / implement new defences (bunds and floodwalls) now to manage longer term increasing flood and erosion risk posed by sea level rise.
SMZ 3b W10 W13 – W14	Western Yar estuary	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	H&S and access (minor repairs to cyclepath i.e. debris removal).
		Do Minimum (and PLP)	Maintain H&S and access (minor repairs to cyclepath i.e. debris removal). Recommend Property Level Protection for the few residential properties at very significant flood risk.
		Do Minimum (and PLP) with Managed Realignment between 2025 and 2055	Maintain existing structures, H&S and cycle and footpath access. If funding can be secured, managed realignment at Thorley Brook between 2025 and 2055 to provide environmental mitigation and create intertidal habitat. Recommend Property Level Protection for the few residential properties at very significant flood risk.
		Maintain (and PLP)	Maintenance of existing structures (including cycle path repairs) and refurbishment at end of design life. Recommend Property Level

Table 7.3 Strategic options appraised for each Strategy Management Zone (SMZ)			
SMZ / ODUs	**Area**	**Option**	**Description**
			Protection for the few residential properties at very significant flood risk.
SMZ 3c W11 - W12	Freshwater (The Causeway and Freshwater Bay)	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	H&S and access. Flood warning and emergency response plan.
		Adaption and Resilience (and PLP) / Do Minimum	Recommend Property Level Protection and flood warning / emergency response plan for residential properties at very significant risk.
		Maintain (and PLP) then Improve (2055)	Maintenance of existing structures and recommend Property Level Protection to the residential properties at significant flood risk. Refurbishment of existing defences at Freshwater Bay at end of design life to prevent erosion risk and implement new defences at Freshwater Village in the long term to mitigate flood risk and improve the standard of protection.
		Maintain and Improve (now)	Maintain existing defences at Freshwater Bay, improve standard of protection at Freshwater Village. Refurbishment of existing defences at end of design life at Freshwater Bay to mitigate erosion risk and implement new defences at Freshwater village to improve the standard of flood protection.
SMZ 4 W18 – W20	Newtown Coast (Bouldnor cliff to Thorness Bay)	Do Nothing	No active intervention. Baseline scenario
SMZ 5a W21 – W22	Gurnard Luck and Gurnard cliff	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	H&S and access. Provide flood warning and emergency response plan.
		Do Minimum and Resilience then Adapt	Recommend community and property level flood resistance and resilience at Gurnard Luck. Private maintenance of existing assets permitted (subject to usual consents). In the long term flood risk will increase due to sea level rise but provide a coastal change management area plan to support the SMP (2010) No Active Intervention Policy. Do minimum (maintain H&S) at Gurnard cliff.
		Maintain	Maintenance of existing structures at Gurnard Luck and refurbishment at end of design life. Flood risk will increase over time due to sea level rise. Develop flood warning and emergency response plan. Do minimum (maintain H&S) at Gurnard cliff.
SMZ 5b W23	Gurnard to Cowes Parade	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	Maintain H&S and access and also provide coastal change management area plan.
		Maintain	Maintenance of existing structures and refurbishment or replacement at the end of their residual life to reduce risks of erosion and landslide reactivation. Flood risk will increase due to sea level rise.
		Improve (now).	Implement seawall stabilisation works along Cowes – Gurnard to reduce erosion risk and increase standard of flood protection
SMZ 6a W24 – W25 W31	Cowes and East Cowes	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	Maintain H&S and access. Provide flood warning and emergency response plan.

Table 7.3 Strategic options appraised for each Strategy Management Zone (SMZ)			
SMZ / ODUs	**Area**	**Option**	**Description**
		Do Minimum (and PLP) then Adapt	Recommend Property Level Protection for residential properties at very significant risk and maintain H&S and access. Adapt and provide flood warning / emergency response plan.
		Maintain	Maintenance of existing structures and refurbishment at end of design life. Accept standard of protection will fall over time.
		Sustain (with Temporary Flood Barriers and PLP) then Improve from 2055	In the short and medium term maintain the existing defences and use Temporary Flood Barriers and Property Level Protection to sustain a 1 in 75 year (1.33% AEP) standard of protection in the areas at significant flood risk. Use redevelopment opportunities to facilitate the raising / implementation of new strategic defences. In the long term (from 2055), if the funding can be secured, implement new defences such as seawalls or setback floodwalls to manage the increase in flood and erosion risk posed by sea level rise.
		Sustain (with PLP) then Improve from 2055	In the short and medium term maintain the existing defences and use Property Level Protection and a flood warning / emergency response plan (no Temporary Flood Barriers) to manage and reduce flooding to residential properties at significant risk. Use redevelopment opportunities to facilitate the raising / implementation of new strategic defences. In the long term (from 2055), if the funding can be secured, implement new defences such as seawalls or setback floodwalls to manage the increase in flood and erosion risk posed by sea level rise.
		Improve (now)	Replace and raise frontline defences to provide a 1 in 200 year (0.5% AEP) standard of protection.
SMZ 6b W26 – W28 W30 W32	Medina Estuary and East Cowes Outer Esplanade	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	Maintain H&S and access.
		Maintain	Maintenance of existing structures and refurbishment at end of design life. Accept standard of protection against flooding will fall over time due to sea level rise.
SMZ 6c W29	Newport Harbour	Do Nothing	No active intervention. Baseline scenario
		Do Minimum	Maintain H&S and access. Provide flood warning and emergency response plan.
		Maintain (and PLP) then Improve from 2055 (through redevelopment)	In the short term recommend Property Level Protection to manage and reduce flooding to the few residential properties at very significant risk. Maintain then refurbish existing defences once they reach the end of their service life. In the long term use redevelopment opportunities to facilitate the raising / implementation of new strategic defences to improve the standard of flood protection.
		Maintain (and PLP) then Improve from 2055 (through a frontline scheme)	In the short term recommend Property Level Protection to manage and reduce flooding to the few residential properties at very significant risk. Maintain then refurbish existing defences once they reach the end of their service life. A new frontline scheme from 2055 to improve the standard of flood protection.
		Improve (now)	Raise / implement new defences (bunds and floodwalls) now manage longer term increasing flood and erosion risk posed by sea level rise.

7.4 Strategic Option Appraisal

The options of each SMZ were appraised against technical, economic, social and environmental criteria. The SEA provided the mechanism for the environmental appraisal.

Options were assessed against the assessment criteria developed within the SEA Scoping Report and reproduced in Table 3-2. For each environmental receptor a number of key environmental issues have been identified.

Subsequently the assessment aims to determine the likely environmental effects and impacts a potential SMZ option is likely to have upon the environment. Determination of the effect is based on examining the sources of effect that may occur (physical, chemical or biological), the pathway (or route) by which the effect could influence a receptor (e.g. direct footprint disturbance or indirect coastal process change), and the receiving environment or resource (the receptor).

When undertaking the assessment, consideration has been given to the compatibility of strategic options with broader SEA Objectives, guidance on developing such objectives is outlined in the CLG Guidance on SEA. These objectives (when considered in relation to flood and water management strategies) have the broad aims of:

1. Protecting and enhancing human health and wellbeing;
2. Raising awareness and understanding of flooding and its dangers;
3. Protecting, conserving and enhancing biodiversity, wildlife corridors and habitats;
4. Protecting and enhancing the water quality and hydromorphology of watercourses, WFD waterbodies and groundwater;
5. Promoting sustainable flood risk management;
6. Minimising the risk of flooding on existing and future key assets, infrastructure, homes and businesses;
7. Managing and mitigating the future effects of climate change in new and existing developments;
8. Conserving and enhancing the historic environment, heritage assets and their settings; and,
9. Protecting, conserving and enhancing the quality, character and availability of open spaces and natural resources.

The assessment was a qualitative exercise based on professional judgement taking into account the detailed understanding of the frontage and the information gathered in the Scoping Report as well as other available data and background information relevant to the issues raised in The Strategy.

The assessment is conducted via the use of matrices which highlight the likely impacts of the Strategy objectives upon the environment. The impacts are determined by considering the following:

- Whether the impact is **adverse or beneficial**;
- The **magnitude** of the potential impact;

- Whether the impact is **secondary, cumulative and/or synergistic;**
- Whether the impact results **directly or indirectly** from the Strategy objectives and measures;
- The **spatial extent** (local, regional or national);
- The **timescale**
    - Short term – expected in the next 1-5 years;
    - Long term – expected in the next 5+ years; and,
- The **permanence** and **reversibility** (permanent or temporary & reversible or irreversible).

Table 7-4 shows the 'scores' which were allocated to the SMZ Options. Where it has been considered that 'no relationship' exists between the SMZ Options and the SEA objectives this does not mean that there is no potential for impacts to arise in the future. A score of no relationship indicates that further information would be required on how and where measures are to be developed (information which is not available at the strategic level).

Table 7-4: SMZ Option Impacts Description

Type of Impact	Description
Major positive (+2)	Significantly beneficial to assessment criteria – Multiple opportunities for environmental improvement or resolves existing environmental issue.
Minor positive (+1)	Partially beneficial (not significant) to the assessment criteria – Contributes to resolving an existing environmental issue or offers some opportunities for improvement.
No relationship / Neutral (N)	Neutral effect on the assessment criteria and environment.
Uncertain (?)	Insufficient detail on the option or baseline – Cannot effectively assess the significance of the option on the assessment criteria.
Minor negative (-1)	Partially undermines (not significantly) the assessment criteria – Option would contribute to an environmental issue or reduce opportunities for improvement.
Major negative (- 2)	Significantly undermines assessment criteria – Will significantly contribute to an environmental problem or undermine opportunity for improvement.

The flood modelling and coastal erosion risk data was used to inform the assessment of flood mitigation benefits posed by the various options. It should be understood that uncertainty increases with time and the predictions made for the later periods are made with a lower degree of confidence than those for the near future.

The results of this environmental appraisal fed into the wider multivariate option appraisal which helped inform the selection of the preferred option. This approach ensured that environmentally unacceptable options would not be taken forward and that the preferred options are environmentally sustainable.

The summary appraisal matrices for the strategic options are presented in Table 7-5 to Table 7-15.

Table 7-5. SEA appraisal matrix for SMZ 1

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Geology &Soil	Water	Total	Notes
Do Nothing	+1	-1	-1	+1	0	0	0	**0**	This option allows for the natural evolution of nature conservation, consequently there is unlikely to be any adverse effects on designated sites. Erosion is likely to threaten the significant heritage interest of the Headland including the Needles Battery Site (SM) where there will be full or partial loss. The iconic landscape of the Needles and the Alum coloured sands is likely to be maintained, yet the loss of the Needles Battery Site is likely to affect the historic landscape. Health and safety obligations relating to the eroding coastline will be accounted for, most likely through private maintenance. There will be no impact along the majority of the frontage regards to material assets. Geology and soil along with water quality is unlikely to be affected.

Table 7-6. SEA appraisal matrix for SMZ 2

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Geology & Soil	Water	Total	Notes
Do Nothing	+1	-1	-1	-1	-1	-1	0	**-4**	There are likely to be minor beneficial impacts in regards to nature conservation, for instance the Colwell Bay SSSI would maintain important geological exposures. Under a do nothing scenario there may be additional landslides in the area which may affect heritage assets including Fort Albert and Fort Victoria. Such landslides will also impact upon the integrity of geology and soils. Human health potentially impacted due to loss of coastal access and H&S provisions and potential psychological impacts from loss of properties The loss of heritage assets such as Fort Albert may have an adverse impact upon the local landscape. Adverse impacts may also arise at Cliff End Battery, At Colwell Bay there is likely to be continuing cliff retreat will affect part of the cliff top holiday park. Access to Fort Albert and the cliff top properties will be at risk. Increasing erosion from the adjacent units to the north and south will also increase the risk of cliff top chalets and buildings. Water quality is unlikely to be affected.
Do Minimum	+1	-1	-1	+1	+1	-1	0	**0**	An assessment of the strategic option ‘Do Minimum’ for SMZ2 is similar to that of a ‘Do Nothing’ Scenario. However, the ‘Do Minimum’ option is likely to prevent adverse effects upon human health through enhanced H&S safety provision along with improved access for the short and medium term. The impact upon health and material assets is also reduced through the development of CCMA which will prevent inappropriate development. The approach for this SMZ is one of adaptation, enabling people and properties at

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Geology & Soil	Water	Total	Notes
									risk to adapt to their changing environment with relocation where necessary.
Maintain then Improve from 2025: Phased seawall improvement and cliff stabilisation. Maintain defences (W2-W4) until end of design life then implement phased cliff drainage and sea wall stabilisation works (for example a mass rock revetment). Do minimum elsewhere.	-1	-1	-1	0	0	+1	0	**-2**	In regards to nature conservation, this option may result in coastal squeeze and a reduction in intertidal habitat in areas such as Totland, Colwell and Fort Albert. Little change is expected in areas such as Central Colwell Bay whilst at Fort Victoria County Park intertidal foreshore areas may increase. Whilst the defences at Fort Albert will be maintained and residual life enhanced as a result, a lack of improvement works in the future is likely to result in a full or partial loss of heritage assets in the future. Adverse impacts may also arise at Cliff End Battery. This is likely to affect landscape quality. Material assets will be defended and subsequently human health will be protected. Continued access will also be facilitated. Cliff stabilisation works are likely to enhance the stability and integrity of soils and geology. Water quality is unlikely to be affected.
Improve (now): Seawall stabilisation works (for example a mass rock revetment) and cliff stabilisation and drainage now (W2-W4). Do minimum elsewhere.	-1	-1	-1	0	0	+1	0	**-2**	In this instance the timing in which measures are undertaken (i.e. improvement now vs improvement upon the end of the design life of structure) does not alter the outcome of the strategic options assessment.

Table 7-7. SEA appraisal matrix for SMZ 3a

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Do Nothing	-1	-1	-1	-2	-2	0	-1	**-8**	Nature conservation is likely to be adversely impacted under a 'Do Nothing' scenario in areas such Norton Spit (Solent Maritime SAC) and at Yarmouth (SPA, SAC and SSSI designations may be affected). The long-term loss of Fort Victoria is expected under this scenario. Other listed buildings and scheduled monuments may be affected adversely. There would also be damage to the historic character and landscape of Yarmouth, including loss of Yarmouth Castle. A failure in defences from Fort Victoria to Norton Spit would affect the local access road, several properties, holiday cottages and tourism businesses. There is significant flood risk to the town of Yarmouth and potentially serious problems relating to access/egress routes and emergency planning. Water quality may be affected by saline intrusion at Yarmouth and the surrounding area. Similarly water pollution may arise as a result of the flooding of agricultural land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Do Minimum: H&S and access. Flood warning and emergency response plan.	-1	-1	-1	-1	-2	0	-1	**-7**	An assessment of a 'Do Minimum' scenario is similar to that of a 'Do Nothing' scenario. Whilst health and safety measures, improved access, flood warnings and the development of an emergency response plan all act to reduce risks to

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
									health and safety, a residual risk remains. This is due to the fact that the 'Do Minimum' option does not reduce flood hazard, it simply increases preparedness. Whilst an enhanced preparedness reduces risk, the hazard remains. In addition, the mental health implications of being flooded are not alleviated by this option.
Maintain (and Temporary Flood Barriers) then Improve from 2055: Use Temporary Flood Barriers to manage and reduce flooding to areas at significant risk by sustaining a 1 in 75 year (1.33 % AEP) standard of protection. Prevent erosion to critical infrastructure serving the town and the West Wight. From 2055, if funding can be secured, raise / implement new defences (bunds and floodwalls) to manage long term increase in flood and erosion risk posed by sea level rise.	0	+1	+1	+2	+2	0	+1	**+7**	Maintenance would prevent the migration and breach of designated SAC features. However in some areas natural processes would become constrained. The medium to long-term loss of Fort Victoria is expected under this scenario. However, the Strategy permits privately funded maintenance to existing defence assets at Fort Victoria. Heritage assets outside of W8 such as Yarmouth Castle will be protected by the Strategy. The significant flood risk to Yarmouth will be reduced by the temporary barriers and the subsequent defence improvements which will protect both material assets and human health. The continued maintenance of defences which protect the road will enhance access. The prevention of salt water intrusion is likely to maintain water quality. Geology and soil is not likely to be affected. Defences are mainly set back with minimal defence encroachment anticipated and therefore any impacts are set to be minimal and temporary.
Maintain (and PLP) then Improve from 2055: Use Property Level Protection to manage and reduce flooding to residential properties at very significant risk. Prevent erosion to critical infrastructure serving the town and the West Wight. From 2055, if funding can be secured, raise / implement new defences (bunds and floodwalls) to manage long term increase in flood and erosion risk posed by sea level rise.	0	+1	-1	+1	+1	0	+1	**+3**	An SEA assessment of a 'Maintain and PLP then Improve from 2055' scenario is very similar to that of a 'Maintain (and temporary flood barriers) then Improve' scenario. However, whilst PLP prevents internal flooding and therefore protects human health and material assets to a degree, risks are still posed such as those relating to human wellbeing. Similarly, externally material assets may be adversely affected. In conclusion, whilst generally the impacts associated with PLP are positive, the benefits are not as great as maintenance with the use of flood barriers.
Improve (now): Raise / implement new defences (bunds and floodwalls) now manage longer term increasing flood and erosion risk posed by sea level rise.	0	+1	+1	+2	+2	0	+1	**+7**	An SEA assessment of an 'Improve (now)' scenario is identical to that of a 'Maintain (and temporary flood barriers) then Improve' scenario. For example the new defence will be mainly set back and minimal defence encroachment is anticipated, therefore biodiversity will not be impacted any more than originally concluded under a Maintain scenario. Similarly, major beneficial impacts are expected to arise under this scenario for both material assets and human health.

Table 7-8. SEA appraisal matrix for SMZ 3b

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Do Nothing	-1	-1	-1	-1	-1	0	-1	**-6**	Under the 'Do Nothing' scenario there will be no action taken and the estuary will be allowed to evolve naturally. As a result, there is potential for significant impacts to occur in regards to nature conservation and biodiversity. One potential negative impact relates to climate change and sea level rise; with estuary saltmarsh likely to be sensitive to changes in water levels unless vertical sediment accretion can compensate. Further assessments, such as a GIS topographic analysis of sediment accretion rates and sea level rise, would be required to more accurately assess the potential impact on saltmarsh habitats of the Do Nothing scenario. Whilst there is potential for negative biodiversity impacts, there is also increasing potential during the second epoch for a breach through the foreshore and embankment enabling the creation of a small tidal inlet into Thorley Brook, which may offer nature conservation benefits. There are potential impacts on historical features near Thorley, on the Western shore impacts are expected listed buildings at King's Manor and palaeoenvironmental deposits currently protected by saltmarsh. Consequently, landscape value may be adversely affected through the loss of heritage features. In regards to material assets, the use of the harbour and waterside would be constrained, similarly there is likely to be inundation of local transport links. These impacts are likely to adversely impact human health as a result of reduced access. Soil is likely to be unaffected. Water quality may be affected by inundation and salt water intrusion. Similarly water pollution may arise as a result of the flooding of agricultural land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Do Minimum: H&S and access (minor repairs to cyclepath i.e. debris removal).	0	-1	-1	+1	-1	0	-1	**-3**	A 'Do Minimum' assessment is similar to a 'Do Nothing' assessment; however, impacts upon human health and subsequent scorings are altered, usually to reflect associated benefits. In this case, human health benefits are derived from enhanced access and health and safety provision.
Do minimum (and PLP): Maintain H&S and access (minor repairs to cyclepath i.e. debris removal). Recommend Property Level Protection for the few residential properties at very significant flood risk.	0	-1	-1	+1	+1	0	-1	**-1**	A 'Do minimum (and PLP) scenario is similar to a 'Do Minimum' scenario, with human health experiencing minor benefits as a result of the scheme. Similarly, it is also anticipated that material assets will experience minor benefits as a result of the internal protection offered by PLP. However, whilst PLP prevents internal flooding and therefore protects human health and material assets to a degree, risks are still posed such as those relating to human wellbeing. Similarly, externally material assets may be adversely affected; consequently major benefits are not expected under this scenario.
Do minimum (and PLP) with Managed Realignment between 2025 and 2055: Maintain existing structures, H&S and cycle and footpath access. If funding can be secured, managed realignment at Thorley Brook between 2025 and 2055 to provide environmental mitigation and create intertidal habitat. Recommend Property Level Protection for the few residential properties at very significant flood risk.	+2	+1	+1	+2	+2	0	**0**	**+8**	As a result of habitat creation at Thorley Brook positive impacts expected to occur in human health, landscape, biodiversity and material assets.

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Maintain (and PLP) - Maintenance of existing structures (including cycle path repairs) and refurbishment at end of design life. Recommend Property Level Protection for the few residential properties at very significant flood risk.	+1	+1	+1	+1	+1	0	0	**+5**	Maintenance will support the core objectives of the Estuary in regards to nature conservation and will support the landscape value and the AONB designation. The heritage assets at risk under a 'Do Nothing' scenario are likely to be protected with effective maintenance. Maintenance is likely to reduce flood risks posed to a number of properties, however residual flood risk remains in localised areas of property adjacent to the floodplain. Soil is likely to be unaffected. Salt water intrusion and inundation is likely to be minimised and therefore water quality is unlikely to be affected.

Table 7-9. SEA appraisal matrix for SMZ 3c

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Do Nothing	-1	-1	0	-2	-2	0	-1	**-7**	A 'Do Nothing' approach at the Causeway is likely to breach the short length of flood defences resulting in tidal inundation of habitats upstream in Freshwater. Heritage may be adversely impacted such as the Causeway itself, WWII pillbox and All Saints Church. A historic narrow river valley is also present behind the sea wall at Freshwater Bay There are likely to be changes to the landscape of the area but these are not expected to be significantly adverse. With no further defence works the estuary could breach and be open to the sea at both ends, creating dynamic and unpredictable tidal conditions with potential for inundation of properties in the town of Freshwater. Transport links between West Wight and the rest of the Island are also shown to be at risk. Water quality may be affected as a result of salt water intrusion. Similarly water pollution may arise as a result of the flooding of agricultural land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Do Minimum: H&S and access. Flood warning and emergency response plan.	-1	-1	0	-1	-2	0	-1	**-6**	A 'Do Minimum' scenario is very similar to a 'Do Nothing' scenario. Under a 'Do minimum' scenario human health is protected to a greater level through enhanced access and the development of an emergency response plan. However, adverse residual impacts upon human health remain such as impacts upon wellbeing.
Adaption and Resilience (and PLP) / Do minimum: Recommend Property Level Protection and flood warning / emergency response plan for residential properties at very significant risk.	-1	-1	0	-1	-1	0	-1	**-5**	The scenario of 'Adaptation and Resilience (and PLP) / Do Minimum' is similar to that of a 'Do Nothing' scenario for all environmental receptors bar material assets and human health. In regards to material assets, PLP will facilitate internal protection yet externally damages are still possible. Similarly with human health, PLP will help to protect human health yet residual risks will remain.
Maintain (and PLP) then Improve (2055): Maintenance of existing structures and recommend Property Level Protection to the residential properties at significant flood	+1	+1	0	+2	+2	0	0	**+6**	A maintenance and refurbishment approach will support the core objectives of the estuary. Freshwater habitats upstream will also be maintained whilst heritage features are likely to remain protected yet there may be residual risks. Properties in Freshwater village would be protected from tidal inundation and

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
risk. Refurbishment of existing defences at Freshwater Bay at end of design life to prevent erosion risk and implement new defences at Freshwater Village in the long term to mitigate flood risk and improve the standard of protection.									vital transport links between West Wight and the rest of the Island would be maintained facilitating continued access. There are likely to be changes to the landscape of the area but these are not expected to be significantly adverse. There are unlikely to be any affects upon geology and soil. Maintenance and refurbishment of existing defences at Freshwater Bay will limit the potential for saltwater intrusion, although a residual risk remains.
Maintain and Improve (now): Maintain existing defences at Freshwater Bay, improve standard of protection at Freshwater Village. Refurbishment of existing defences at end of design life at Freshwater Bay to mitigate erosion risk and implement new defences at Freshwater village to improve the standard of flood protection. Maintain existing defences at	+1	+1	0	+2	+2	0	0	**+6**	Heritage, biodiversity and environmental features are likely to remain protected. Neutral impacts on landscape are anticipated. Due to the improvement works recommended by this scenario, the SoP offered to areas such as Freshwater Village will provide major benefits and subsequently human health benefits are anticipated. There are unlikely to be any impacts upon geology, soil and water quality.

Table 7-10. SEA appraisal matrix for SMZ 4

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Do Nothing	+1	-1	+1	-1	-1	-1	0	**-2**	A ‘Do Nothing’ Scenario will allow for the natural evolution of nature conservation interest, will ensure the continued sediment source and transport pathways and will improve landscape and AONB features in the long-term. There may be minor adverse impacts in the first and second epochs such as saltmarsh inundation. A ‘Do Nothing’ scenario will fail to prevent flooding of part of a Scheduled Monument (the remains of the medieval town of Newtown) and widespread exposure and loss of intertidal archaeological resources such as palaeoenvironmental deposits at the mouth of the estuary. Brickfields farmhouse on the eastern spit will be lost to erosion. There are potential risks to several properties near Cranmore along with there being several risks to parts of the Thorness Bay Holiday Park and scattered buildings between Thorness and Gurnard Luck Under a ‘Do Nothing’ scenario the coastal slopes would continue to evolve naturally, with erosion of the cliff toe and cliff foot debris triggering mudslides, translational slides and infrequent deep-seated rotational slides Water quality is unlikely to be affected.

Table 7-11. SEA appraisal matrix for SMZ 5a

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil & Geology	Water	Total	Notes
Do Nothing	0	0	0	-2	-2	0	0	**-4**	In this area, erosion of the low lying coastal frontage will continue and tidal inundation will occur more frequently. With no maintenance and failure of the control structures, Gurnard Luck Stream could divert and flow over March Road flooding properties. The village of Gurnard will be exposed to numerous threats simultaneously (i.e. flooding and erosion) and these processes will result in the accelerated deterioration and collapse of defences. The collapse of defences and flooding of the marsh areas will result in the creation of intertidal mudflats and saltmarsh in the medium to long-term. As coastal grazing marshes become more brackish they will erode to more sustainable intertidal mudflats and saltmarsh. Landscape and heritage value is set to remain unchanged. Water pollution may arise as a result of the flooding of agricultural land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Do minimum: H&S and access. Provide flood warning and emergency response plan.	+1	0	0	-1	-2	0	0	**-2**	A 'Do Minimum' scenario is very similar to a 'Do Nothing' scenario. Under a 'Do minimum' scenario human health is protected to a greater level through enhanced access and the development of an emergency response plan. However, adverse residual impacts upon human health remain such as impacts upon wellbeing as a result of flooding.
Do minimum and Resilience then Adapt: Recommend community and property level flood resistance and resilience at Gurnard Luck. Private maintenance of existing assets permitted (subject to obtaining the required consents). In the long term flood risk will increase due to sea level rise but provide a coastal change management area plan to support the SMP (2010) No Active Intervention Policy. Do minimum (maintain H&S) at Gurnard cliff.	+1	0	0	+1	+1	0	0	**+3**	A 'Do Minimum and Resilience then Adapt' scenario is assessed as per the previous two scenarios for SMZ 5a. However, the scorings for Human Health and Material Assets take into account the additional measures put forward, both of which are predicted to have minor beneficial impacts as a result of residual risks. For instance with material assets, PLP will facilitate internal protection yet externally damages are still possible. In addition, the development of a CCMA is likely to further prevent damages arising to new developments yet cannot protect material assets already in situ. Similarly with human health, health and safety measures will enhance access, PLP &/or resilience will help to protect human health, and the CCMA will prevent future residents from being put at risk of flooding.
Maintain: Maintenance of existing structures at Gurnard Luck and refurbishment at end of design life. Flood risk will increase over time due to sea level rise. Develop flood warning and emergency response plan. Do minimum (maintain H&S) at Gurnard cliff.	+1	0	0	+1	+1	0	0	**+3**	This scenario supports the SAC designation by limiting erosion and will protect a number of heritage assets such as listed buildings. At Gurnard Luck further breach and erosion of the frontage will be prevented and therefore properties and the wider built environment will remain protected. However, amenity use of beaches could be limited by reduced sediment supply in tandem with sea-level rise. The existing defence levels are not currently high enough to prevent overtopping and tidal flooding. Therefore the refurbishment anticipated at the end of the design life of structures will reduce the risk to communities in tandem with the development of a flood warning and emergency response plan. Beaches of poor sediment and ecological quality may be lost through coastal squeeze in the long-term.

Table 7-12. SEA appraisal matrix for SMZ 5b

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil & Geology	Water	Total	Notes
Do Nothing	0	-1	0	-2	-2	-1	0	-6	The designated SAC is unlikely to be affected. Landscape features will be retained. A number of listed buildings may be adversely affected. The esplanade road from Gurnard to Cowes will be increasingly affected by episodes of tidal inundation through the first epoch prior to seawall failure. The public highway, residential properties, footpath access and public open space will be affected in this area. These events could inundate roads and infrastructure along the frontage (seafront properties between Queens Road and the Esplanade) and may also assist in saturating and destabilising the coastal slopes at risk of landslide reactivation. Coastal erosion at the toe of the coastal slope could trigger landslide reactivation at 2m/year.
Do minimum: Maintain H&S and access and also provide coastal change management area plan	0	-1	0	-1	-1	-1	0	**-4**	A 'Do Minimum' assessment is very similar to a 'Do Nothing' assessment as without further maintenance defences will fail causing residual damages. However, enhanced health & safety provision along with continued access is likely to offer benefit to human health. Additionally, the development of a CCMA for the coastal slopes area will prevent future inappropriate development in the area and subsequently facilitate enhanced health and wellbeing in the future.
Maintain: Maintenance of existing structures and refurbishment or replacement at the end of their residual life to reduce risks of erosion and landslide reactivation. Flood risk will increase due to sea level rise	0	+1	0	+1	+1	+1	0	**+4**	Impacts on nature conservation should be neutral and the historic built environment of Cowes waterfront will be maintained alongside a number of listed buildings. Maintenance of existing defences will help protect against erosion and landslide reactivation and provide continued access along the esplanade and parade. However, without raising the defences, flood risk is expected to increase in the future. Human health and material assets are therefore likely to benefit from erosion protection, but the benefits will not be maximized due to the residual flood risk. Water quality is unlikely to be affected.
Improve (now): Implement seawall stabilisation works along Cowes – Gurnard to reduce erosion risk and increase standard of flood protection	-1	+1	-1	+2	+2	+1	0	**+4**	Under the 'Improve now' scenario a large number of properties continue to be defended against flooding, erosion and landslide reactivation, providing major benefits to human health and material assets. Improvement of defences now is more likely to lead to minor defence encroachment (potentially impacting biodiversity) and landscape impacts as frontline schemes are likely to be considered favorable (due to the complexity of the existing frontage and space restrictions which reduce opportunities for setback alignments).

Table 7-13. SEA appraisal matrix for SMZ 6a

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Do Nothing	-1	-1	-1	-2	-2	0	-1	**-8**	Natural change may involve loss and change of important intertidal habitats (i.e. erosion of saltmarsh to mudflats), particularly around the estuary mouth. Natural roll-back would be constrained naturally by height of the land. A number of listed buildings may be adversely affected. The low-lying coastal land is heavily developed with a combination of residential, commercial and industrial properties including wharfs, large marinas and associated facilities essential to the marine industries of the town, under a 'Do Nothing' scenario these properties are likely to be affected adversely. Under a 'Do Nothing' scenario, with sea level rise, both East Cowes will experience flooding on most tides which has major implications for human health. The loss of historically designated buildings, habitat deterioration and expected damages to material assets is likely to significantly affect the iconic landscape of the estuary. Saline intrusion may adversely affect water quality. Impacts upon geology and soil are not anticipated. Similarly water pollution may arise as a result of the flooding of agricultural land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Do minimum: Maintain H&S and access. Provide flood warning and emergency response plan.	-1	-1	-1	-1	-2	0	-1	**-7**	A 'Do Minimum' scenario is very similar to a 'Do Nothing' scenario. Under a 'Do minimum' scenario human health is protected to a greater level through enhanced access and the development of an emergency response plan. However, adverse residual impacts upon human health remain such as impacts upon wellbeing.
Do minimum (and PLP) then Adapt: Recommend Property Level Protection for residential properties at very significant risk and maintain H&S and access. Adapt and provide flood warning / emergency response plan.	-1	-1	-1	+1	+1	0	-1	**-2**	A 'Do Minimum (and PLP) then Adapt' scenario is assessed as per the previous two scenarios for SMZ 5a. However, the scorings for Human Health and Material Assets take into account the additional measures put forward, both of which are predicted to have minor beneficial impacts as a result of residual risks. For instance with material assets, PLP will facilitate internal protection yet externally damages are still possible. In addition, the development of a CCMA is likely to further prevent damages arising to new developments yet cannot protect material assets already in situ. Similarly with human health, health and safety measures will enhance access, PLP will help to protect human health, and the CCMA will prevent future residents from being put at risk of flooding. Water pollution may arise as a result of the flooding of agricultural land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Maintain: Maintenance of existing structures and refurbishment at end of design life. Accept SoP will fall over time.	0	-1	-1	-1	-1	0	-1	**-5**	The defences will provide protection in the short term, but over-time the SoP will fail. In the long term adverse impacts are anticipated across the majority of environmental receptors, similar to that of a 'Do Nothing' scenario.
Sustain (with Temporary Flood Barriers and PLP) then Improve from 2055: In the short and medium term maintain the existing defences and use	0	+1	0	+1	+2	0	0	**+4**	A number of listed buildings would be protected. By sustaining the SoP and through use of demountables, properties and therefore people are protected with PLP acting as a final measure to ensure safety. Improving the SoP in 2055 will ensure the local communities are

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Temporary Flood Barriers and Property Level Protection to sustain a 1 in 75 year (1.33% AEP) standard of protection in the areas at significant flood risk. Use redevelopment opportunities to facilitate the raising / implementation of new strategic defences. In the long term (from 2055), if the funding can be secured, implement new defences such as seawalls or setback floodwalls to manage the increase in flood and erosion risk posed by sea level rise.									protected in the future. As a result of the protection of offered the iconic landscape of the estuary is likely to be maintained. Soils and geology are unlikely to be affected. Water pollution may arise as a result of the residual flooding of agricultural land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Sustain (with PLP) then Improve from 2055: In the short and medium term maintain the existing defences and use Property Level Protection and a flood warning / emergency response plan (no Temporary Flood Barriers) to manage and reduce flooding to residential properties at significant risk. Use redevelopment opportunities to facilitate the raising / implementation of new strategic defences. In the long term (from 2055), if the funding can be secured, implement new defences such as seawalls or setback floodwalls to manage the increase in flood and erosion risk posed by sea level rise.	0	+1	-1	+1	+1	0	0	**+2**	A SEA of a 'Sustain (with PLP) then Improve from 2055' scenario is very similar to that of a 'Sustain (with Temporary Flood Barriers and PLP) then Improve from 2055' scenario. However, this scenario does not use demountable temporary barriers. Therefore the risk to both material assets and human health is slightly increased, meaning only a minor beneficial impact is facilitated as a result of this scenario.
Improve (now): Replace and raise frontline defences to provide a 1 in 200 year (0.5% AEP) standard of protection.	-1	+1	-1	+2	+2	0	0	**+3**	For the purposes of an SEA, an 'Improve now' scenario is identical to that of the 'Sustain' scenarios above. This is due to the fact that the same level of protection is provided to environmental receptors irrespective of whether improvement occurs now or in epoch 3 as a result of maintenance. However, the installation of certain defence measures, such as sheet piling (for example) may have adverse consequences upon both biodiversity and landscape features.

Table 7-14. SEA appraisal matrix for SMZ 6b

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Do Nothing	+1	0	0	0	-1	0	0	**0**	Whilst there is the possibility for loss and change of important intertidal habitats, the central sections of the estuary will evolve naturally, though there is a waterside development area and a marina present, which will impede natural change along limited frontages during the first epoch prior to defence deterioration and failure. The area is also constrained in regards to space for natural roll back. In the central Medina (in the short sections that are defended), a 'Do Nothing' approach is likely to result in the potential inundation and/or loss of isolated properties and the failure of wharfside walls may impact upon the commercial operation of the estuary, including the marine industry. There may be possible adverse impacts on route of the cycle route/footpath. Generally this plan would maintain the landscape in its current form with some loss of terrestrial land to flood and erosion. Adverse impacts upon human health are not expected. There is unlikely to be effects of water quality and geology/soil
Do minimum: Maintain H&S and access. Provide flood warning and emergency response plan.	+1	0	0	+1	-1	0	0	**+1**	A 'Do Minimum' scenario is very similar to a 'Do Nothing' scenario. Under a 'Do minimum' scenario human health is protected to a greater level through enhanced health, safety and access provision.
Maintain: Maintenance of existing structures and refurbishment at end of design life. Accept standard of protection against flooding will fall over time due to sea level rise.	-1	0	0	+1	+1	0	0	**+1**	Would prevent natural processes along this estuary stretch, the historic environment of this frontage would be protected and landscape quality would be maintained. With active maintenance a number of properties will continue to be defended against flooding and erosion which will act to protect human health. It is anticipated that soils and geology along with water quality will not be affected.

Table 7-15. SEA appraisal matrix for SMZ 6C

Strategic Option	Biodiversity	Cultural Heritage/Historic Environment	Landscape	Health	Material Assets	Soil	Water	Total	Notes
Do Nothing	-1	-1	-1	-2	-2	0	0	**-7**	At Newport Harbour, the failure of defences would only allow for marginal roll-back of the intertidal habitats due to the relatively steep topography of the river. A number of historical listed buildings may be at risk under a 'Do Nothing' scenario. As a result, the historic landscape of Newport quayside may be adversely affected. At the southern limit of the Medina Estuary, around Newport Harbour, the defences (without maintenance) are expected to fail late in the first epoch or early in the second epoch affecting property, a number of listed buildings and infrastructure. Consequently human health may be compromised. Due to the increased flood risk along the estuary, there could be some disruption to Newport, affecting the harbourside marine industry and commercial wharfs. It is anticipated that geology and soil will not be affected by a 'Do Nothing' scenario. Water pollution may arise as a result of the flooding of amenity and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Do minimum: Maintain H&S and access. Provide flood warning and emergency response plan.	-1	-1	-1	-1	-2	0	0	**-6**	A 'Do Minimum' scenario is very similar to a 'Do Nothing' scenario. Under a 'Do minimum' scenario human health is protected to a greater level through enhanced health, safety and access provision, in addition to the development of a flood warning and emergency response plan.
Maintain (and PLP) then Improve from 2055 (through redevelopment): In the short term recommend Property Level Protection to manage and reduce flooding to the few residential properties at very significant risk. Maintain then refurbish existing defences once they reach the end of their service life. In the long term use redevelopment opportunities to facilitate the raising / implementation of new strategic defences to improve the standard of flood protection.	-1	+1	+1	+1	+2	0	0	**+4**	The impacts on nature conservation are anticipated to be neutral, whilst the historic built environment of Newport Harbour will be maintained under the preferred plan as a result of numerous listed buildings being protected. Consequently the historic landscape will be maintained. With continuing maintenance, a number of properties will be defended against flooding. Despite this, regular inundation of significant areas of Newport Harbour is likely as the majority of defence levels are likely to be insufficient as they were not designed to protect against the prevailing conditions on a 50-100 year timescale. Whilst PLP will offer additional protection in tandem with maintenance, residual risks will remain to material assets and human health. Redevelopment is likely to be required to 'take development out the flood zone' which also have benefits for both material assets and human health. It is anticipated that there will be no adverse impacts upon geology and soil. Water pollution may arise as a result of the flooding of amenity land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.
Maintain (and PLP) then Improve from 2055 (through a frontline scheme): In the short term recommend Property Level Protection to manage and reduce flooding to the few residential properties at very significant risk. Maintain then refurbish existing defences once they reach the end of their service life. A new frontline scheme from 2055 to improve the standard of flood protection.	-1	+1	+1	+1	+2	0	0	**+4**	A SEA of the 'Maintain (and PLP) then Improve from 2055 (through a frontline scheme)' scenario is very similar to that of the 'Maintain and Adaption and Resilience (PLP)' scenario. However, as aforementioned a number of defences at Newport Harbour may be insufficient to prevent flooding even with maintenance and therefore a residual risk of flooding will remain.
Improve (now): Raise / implement new frontline defences to manage longer term increase in flood risk posed by sea level rise.	-1	+1	+1	+1	+2	0	0	**+4**	For the purposes of an SEA, an 'Improve now' scenario is identical to that of the 'Maintain then Improve' scenarios. This is due to the fact that the same level of protection is provided to environmental receptors irrespective of whether improvement occurs now or in epoch 3 as a result of maintenance. Water pollution may arise as a result of the flooding of amenity land and sewage treatment infrastructure; this could subsequently impact upon human health and biodiversity.

8. Assessment of the Environmental Effects of the Strategy

8.1 The Preferred Strategy Options

Following the multivariate appraisal of the options, which included the early findings of this SEA amongst other factors, the preferred Strategy options were identified. Whilst environmental factors and the findings of the SEA contributed towards the selection of the preferred options, it should be recognised that other factors such as economic, social and technical factors also contributed. Therefore, the preferred option in the Strategy is not necessarily the option that is likely to deliver the greatest environmental opportunity. Where the preferred Strategy option differs from the environmentally preferred option, a reason is provided in Table 8.1 below. The preferred Strategy options are recommended as follows:

Table 8-1: Preferred and Environmentally Preferred Strategy Options

Strategy Management Zone	The Preferred Strategy Option	Is this the Environmentally Preferred Option?
SMZ 1	**Do Nothing**	N/A – The only option presented for environmental assessment was a 'Do Nothing' scenario. This is due to the fact that there are few receptors which would benefit from works in this area. A 'Do Nothing' approach is beneficial for biodiversity and is anticipated to have neutral impacts on the majority of environmental receptors. However, adverse impacts are predicted in relation to heritage assets and in particular the Needles Battery Site (SM). Mitigation measures are proposed in Section 10.
SMZ 2	**Do Minimum**	Yes
SMZ 3a	**Maintain (and Temporary Flood Barriers) then Improve from 2055:** Use Temporary Flood Barriers to manage and reduce flooding to areas at significant risk by sustaining a 1 in 75 year (1.33 % AEP) standard of protection. Prevent erosion to critical infrastructure serving the town and the West Wight. From 2055, if funding can be secured, raise / implement new defences (bunds and floodwalls) to manage long term increase in flood and erosion risk posed by sea	Yes – Improve now is a joint environmentally preferred option yet has a lower cost-benefit score.

Table 8-1: Preferred and Environmentally Preferred Strategy Options		
Strategy Management Zone	**The Preferred Strategy Option**	**Is this the Environmentally Preferred Option?**
	level rise.	
SMZ 3b	**Do minimum (and PLP) with Managed Realignment between 2025 and 2055**: Maintain existing structures, H&S and cycle and footpath access. If funding can be secured, managed realignment at Thorley Brook between 2025 and 2055 to provide environmental mitigation and create intertidal habitat. Recommend Property Level Protection for the few residential properties at very significant flood risk.	Yes
SMZ 3c	**Maintain (and PLP) then Improve (2055)**: Maintenance of existing structures and recommend Property Level Protection to the residential properties at significant flood risk. Refurbishment of existing defences at Freshwater Bay at end of design life to prevent erosion risk and implement new defences at Freshwater Village in the long term to mitigate flood risk and improve the standard of protection.	Yes – Maintain (and PLP) then Improve (2055) is the joint environmentally preferred option alongside Maintain and Improve (now)
SMZ 4	**Do Nothing**	N/A - The only option presented for environmental assessment was a 'Do Nothing' scenario. This is due to the fact that there are few receptors which would benefit from works in this area. Under a 'Do Nothing' scenario, there are a number of potential benefits associated with biodiversity and landscape. However, minor adverse impacts are anticipated in regards to environmental receptors such as heritage, human health, material assets and geology and soil. Mitigation measures are proposed throughout subsequent sections.

Table 8-1: Preferred and Environmentally Preferred Strategy Options		
Strategy Management Zone	**The Preferred Strategy Option**	**Is this the Environmentally Preferred Option?**
SMZ 5a	**Do minimum and Resilience then Adapt** – Recommend community and property level flood resistance and/or resilience at Gurnard Luck. Private maintenance of existing assets permitted (subject to obtaining the required consents). In the long term flood risk will increase due to sea level rise but provide a coastal change management area plan to support the SMP (2010) No Active Intervention Policy. Do minimum (maintain H&S) at Gurnard cliff. .	Yes – This option and 'Maintain' are both environmentally preferred. However, the 'Do Minimum' option has the highest cost-benefit ratio and therefore in the interests of sustainability and economic viability, is supported by this SEA. Additional studies undertaken after the consultation testing a minor set-back scheme idea (for the short-medium term) then adaptation for Gurnard Marsh also has a similar cost-benefit ratio.
SMZ 5b	**Maintain**: Maintenance of existing structures and refurbishment or replacement at the end of their residual life to reduce risks of erosion and landslide reactivation. Flood risk will increase due to sea level rise.	Yes - This option is the joint environmentally preferred option along with 'Improve (now)'. However, the 'Maintain' option has the highest cost-benefit ratio and therefore in the interests of sustainability and economic viability, is supported by this SEA.
SMZ 6a	**Sustain (with Temporary Flood Barriers and PLP) then Improve from 2055** – In the short and medium term maintain the existing defences and use Temporary Flood Barriers and Property Level Protection to sustain a 1 in 75 year (1.33% AEP) standard of protection in the areas at significant flood risk. Use redevelopment opportunities to facilitate the raising / implementation of new strategic defences. In the long term (from 2055), if the funding can be secured, implement new defences such as seawalls or setback floodwalls to manage the increase in flood and erosion risk posed by sea level rise.	Yes
SMZ 6b	**Do Nothing**	No – However, the preferred option is anticipated to have a neutral impact on environmental receptors overall (minor adverse impacts are anticipated in regards to material assets). Consequently mitigation will be required. It should be noted that the environmentally preferred option is also associated with adverse impacts yet on different receptors i.e. biodiversity, which are currently offset by wider environmental benefits (for assessment

Table 8-1: Preferred and Environmentally Preferred Strategy Options		
Strategy Management Zone	**The Preferred Strategy Option**	**Is this the Environmentally Preferred Option?**
		purposes). Mitigation measures are proposed in Section 13.
SMZ 6c	**Maintain (and PLP) then Improve from 2055 (through redevelopment)** – In the short term recommend Property Level Protection to manage and reduce flooding to the few residential properties at very significant risk. Maintain then refurbish existing defences once they reach the end of their service life. In the long term use redevelopment opportunities to facilitate the raising / implementation of new strategic defences to improve the standard of flood protection.	Yes- This option is the joint environmentally preferred option along with 'Maintain (and PLP) then Improve from 2055 (through a frontline scheme)' and 'Improve (now)'. However, the PLP and maintenance option has the highest cost-benefit ratio and therefore in the interests of sustainability and economic viability, is supported by this SEA.

An appraisal of the likely environmental impacts in each SEA category is presented within Appendix C of this Environmental Report for each of the preferred options. The following chapters outline this appraisal for each preferred option on a category by category basis.

9. Biodiversity

Nature Conservation and the protection and enhancement of Biodiversity is vital to ensuring that ecosystem services are maintained. The ecosystem services derived from flora and fauna have been well documented within the Millennium Ecosystem Assessment (2005)[17] and more recently at the National level in the UK's National Ecosystem Assessment (2011)[18]. As such, nature conservation in the UK is driven by a wide range of policies, legislation and agreements internationally, nationally, regionally and locally. For example the UK's 'Natural Choice'[19] document outlines how we can 'secure the value of nature' and protect and improve our natural environmental whilst growing a green economy.

9.1 Policy Context

Due to the international, national and local importance of the biodiversity within the West Wight area there is a plethora of plans, policies and programmes which have the aim of protecting and enhancing the natural environment, a selection of which is outlined within this section. The overarching aim of all plans and programmes is to protect and enhance the coastal environment, much of which is susceptible to accelerated loss such as saltmarsh communities.

Given the location of the study area and its international importance for biodiversity, the legislation of particular importance are the European Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC).

The Birds Directive (2009/147/EC)[20] requires the protection of wild birds and their habitats within the European Union, largely through the designation of Special Protected Areas (SPAs). The Conservation of Habitats and Species Regulations (2010)[21] provides for the designation and protection of European Sites in the UK. Similarly Biodiversity 2020[22] is a strategy which provides a comprehensive outline of how England is implementing international and EU commitments in regards to nature conservation.

The Habitats Directive (92/43/EEC)[23] aims to protect both species and habitats of European importance and requires Member States to take measures in maintaining or restoring such habitats and their occupants to a favorable conservation status. Largely this is achieved through the designation of SACs. This creates a network of high-quality conservation sites that make a significant contribution to the protection of designated habitats and species.

The Conservation of Habitats and Species Regulations (2010)[24] provides for the designation and protection of European Sites in the UK. The regulations consolidate the various amendments made to the Conservation (Natural Habitats) Regulations 1994[25] in respect of

17 Millennium Ecosystem Assessment (2005) http://millenniumassessment.org/en/Global.html

18 National Ecosystem Assessment (2011) http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=5L6%2fu%2b%2frKKA%3d&tabid=82&bcsi_scan_AB11CAA0E2721250=ate7zZ84SuuSdbYn6HLjIZ9gKUMKAAAAw4TeDg==:1

19 Natural Choice (2011) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228842/8082.pdf

20 Birds Directive (2009/147/EC) http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

21 Conservation of Habitats and Species (2010) http://www.legislation.gov.uk/uksi/2010/490/contents/made

22 Biodiversity 2020 https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services

23 Habitats Directive (92/43/EEC) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043

24 Conservation of Habitats and Species (2010) http://www.legislation.gov.uk/uksi/2010/490/contents/made

25 Conservation (Natural Habitats, &c.) Regulations 1994 http://www.legislation.gov.uk/uksi/1994/2716/contents/made

England and Wales. The 1994 Regulations transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wide flora and fauna (EC Habitats Directive) into national law.

Similarly Biodiversity 2020[26] is a strategy which provides a comprehensive outline of how England is implementing international and EU commitments in regards to nature conservation.

Ramsar sites are considered to be wetlands of international importance as designated under The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) which was adopted in Ramsar, Iran in 1971 and came into force in 1975. The Convention covers all aspects of wetland conservation and use and has three main 'pillars' of activity including: the designation of Ramsar sites, promoting the 'wise-use' of all wetlands and international co-operation to further the sustainable use of wetlands and their resources[27].

Nationally, the Wildlife and Countryside Act (1981)[28] (and amendments) provides statutory protection for SSSIs. The Natural Environment and Rural Communities (NERC) Act (2006)[29] states that every public authority must, in exercising its functions, have regard to the purpose of conserving biodiversity. Within the NERC Act, conservation of biodiversity encompasses the restoration and enhancement of species populations and habitats, in addition to protection. Similarly, the National Planning Policy Framework (NPPF)[30] (2012) states that impacts from development upon biodiversity should be minimised and net gains should be provided where possible.

Regionally, the Hampshire Biodiversity Partnership recently produced a Biodiversity Action Plan (BAP) for Hampshire which reviews the status of wildlife in Hampshire and sets out a framework for action in two parts. Volume one (the strategic plan) outlines the objectives of the partnership, describes Hampshire's biodiversity and identifies habitats and species of priority concern. Volume two contains individual action plans for priority habitats and species and topics which have a considerable influence on the conservation of biodiversity. For instance the Isle of Wight features heavily within the Coastal Habitat Action Plan[31].

The 'Solent Waders and Brent Goose Strategy' (2010)[32] provides analysis and recommendations relating to strategic planning within and around the Solent Coast. The strategy highlights that many of the Brent Geese feeding sites and wader roost sites around the Solent fall outside of the statutory nature conservation site boundaries as designated in the Habitats and Bird Directives, and a large proportion of the bird sites are in flood risk areas as identified by the Environment Agency.

Locally, the Isle of Wight Local Records Centre collects, collates, manages and disseminates information on biodiversity and feeds into important local policy such as the Biodiversity Action Plan (BAP) for the Isle of Wight[33]. The Local BAP[34] highlights the importance of the island's rich

26 Biodiversity 2020 https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services

27 http://jncc.defra.gov.uk/page-1369

28 Wildlife and Countryside Act (1981) http://jncc.defra.gov.uk/page-1377

29 NERC ACT (2006) http://www.legislation.gov.uk/ukpga/2006/16/contents

30 National Planning Policy Framework (2012) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

31 Biodiversity Action Plan for Hampshire. http://www.hampshirebiodiversity.org.uk/action.html

32http://www.solentforum.org/forum/sub_groups/Natural_Environment_Group/Waders%20and%20Brent%20Goose%20Strategy/Solent%20Waders%20and%20Brent%20Goose%20Strategy.pdf

33 http://www.wildonwight.co.uk/lrc/index.php

biological diversity and the benefits which it derives ranging from employment to life-long learning and health benefits. The plan contains a number of objectives which strive to protect and enhance the natural environment based on six key themes:

- Physical environment,
- Sense of place and environmental quality,
- Health and wellbeing,
- Life-long learning,
- Community spirit and education; and,
- Biological diversity.

The Biodiversity Action Plan comprises a number of habitat and species action plans produced from 2000 to 2005 in collaboration with the Isle of Wight Biodiversity Partnership Steering Group[35]. The Wetlands Habitat Action Plan (revised in 2011) is perhaps of most interest to the Coastal Strategy and SEA assessment[36].

Biodiversity is intrinsic to the success and development of the Isle of Wight as shown by the number of new plans, policies and strategies which have been developed. Most recently a revision to the Isle of Wight Ancient Woodland Inventory was made along with review of Sites of Importance for Nature Conservation (SINC). The criteria for SINC designation was reviewed in 2010. An annual review of individual SINCS is undertaken annually with recommendations for change initiated via the Isle of Wight Biodiversity Steering Group. In addition to this, the 'Monitoring for Biodiversity 2020 on the Island' report was developed which encompasses an overview of the state of biological monitoring for the Isle of Wight and a review of priorities[37].

The Isle of Wight Core Strategy[38] also has a number of policies which relate to the protection and enhancement of nature conservation, such as policy SP5 and DM12 (Core Strategy policies beginning with the prefix 'SP' relate to spatial policies whereas policies beginning with the prefix 'DM' relate to development management policies). Additionally, beyond coastal habitat and species action plans, there are a number of action plans which relate to terrestrial species such as the Red Squirrel *(Sciurus vulgaris)* and woodland bats such as the Bechstein Bat *(Myotis bechsteinii).* Species action plans are available on the 'Wild on the Wight' website[39].

The Isle of Wight's 'People for Nature, Nature for People' guidance[40] was produced in June 2005 for the general public and community groups on the Isle of Wight and who have an interest in developing projects related to the Island's biodiversity. In the report biodiversity is identified as:

- Our life support system;
- A source of wealth and jobs;
- A prescription for good health;
- A store of natural knowledge for life-long leaning; and,
- Common ground for local communities.

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34 Isle of Wight Biodiversity Action Plan http://www.wildonwight.co.uk/haps.php and http://www.wildonwight.co.uk/saps.php

35 http://www.wildonwight.co.uk/haps.php

36 Isle of Wight BAP – Wetlands habitat Action Plan (2011) http://www.wildonwight.co.uk/publications/haps/Wetlands,P20HAP_revised,P202011.pdf.pagespeed.ce.ihYIkPlVfg.pdf

37 Environmental Monitoring for 2020 http://www.wildonwight.co.uk/publications/Environmental%20Monitoring%20for%202020.pdf

38 Isle of Wight Core Strategy (2012) http://www.iwight.com/azservices/documents/2776-Core-Strategy-Adopted-March-2012-updated-web-links-May-2013-with-cover.pdf

39 http://www.wildonwight.co.uk/saps.php

40 People for Nature, nature for People (2005) http://www.wildonwight.co.uk/publications/people4nature.pdf

9.2 Policy Objectives

The following objectives have been identified as relevant from a review of international, national and local objectives:

Bern Convention on the Conservation of European Wildlife and Natural Habitats, (1979)[41]:

- To protect endangered species and their habitats.

Wild Birds Directive (2009/147/EC):

- To protect all naturally occurring wild bird species and their habitats, with particular protection of rare species.

Bonn Convention on the Conservation of Migratory Species of Wild Animals, (1979)[42]:

- To protect threatened animals which migrate across national boundaries and/or the high seas.

Habitats Directive (92/43/EEC):

- To protect important natural habitat (listed in Annex I, amended in Directive 97/62/EC) and species (listed in Annex II), using measures to maintain or restore their 'favourable conservation status', principally through the designation of SACs and SPAs but also (through land-use and development policies) by management of the landscape features of importance to wildlife outside SPAs and SACs; and,
- To safeguard species needing strict protection (Annex IV). This Directive is transposed into UK law through the Conservation (Natural Habitats &c.) Regulations, 1994.

Isle of Wight Biodiversity Action Plan:

The objectives contained within the individual habitat action plans which comprise the Isle of Wight BAP are based on the overall fundamental objectives which include:

- Ensure no further loss or degradation of the habitat;
- Increase the extent of the habitat;
- Improve the quality of the habitat;
- Ensure the needs of the species associated with the habitat are met;
- Improve the knowledge of the habitat, and its associated species by survey, research and monitoring; and,
- Raising awareness.

Isle of Wight Biodiversity Action Plan Solent Coastal Habitat Action Plan (2004)[43]:

The habitat action plan includes the following objectives relating to the coastal environment:

- Maintain and enhance the present extent of estuarine and associated habitats;
- Encourage relevant authorities to seek opportunities for further estuarine habitat creation, in line with national targets and other habitat action plans in the Solent area.

41 Bern Convention 1979 http://conventions.coe.int/Treaty/en/Treaties/Word/104.doc

42 Bonn Convention http://www.cms.int/documents/convtxt/cms_convtxt.htm

43 Isle of Wight Biodiversity Action Plan Solent Coastal Habitat Action Plan (2004) http://www.wildonwight.co.uk/publications/haps/SolentCoastalHAP.pdf

Work with other authorities in the Solent area to identify possible areas of mitigation for sea level rise and help to maintain the integrity of the coastal system;
- Ensure the requirements of Isle of Wight estuarine biodiversity action plan species are met and their populations maintained and where possible augmented through appropriate management;
- Improve knowledge of estuarine and associated habitats on the Island through survey research and monitoring and encourage the integration of this research and monitoring with similar work for relevant coastal management plans;
- Communication, awareness and promotion: Promote the importance of estuaries and their habitats, the associated species and the threats to them to key sectors including statutory and voluntary organisations, coastal industries and user groups, landowners, community groups and the public to promote awareness of coastal habitats.

Isle of Wight Biodiversity Action Plan Maritime Cliffs and Slopes Habitat Action Plan (2002)[44]:

The habitat action plan includes the following objectives relating to Maritime Cliffs:

- Ensure existing sites of high quality sea cliff habitat are maintained for their wildlife and earth science interest;
- Re-create sea cliff and slope habitats that have been lost to other land uses;
- Ensure restoration of degraded or neglected sites into habitat and/or exposures of high wildlife and earth science value;
- Establish buffer zones between intensively-managed agricultural land and cliff and slope habitats;
- Ensure the requirements of priority species are met;
- Improve the knowledge of the maritime cliff resource by survey, research and monitoring;
- Communication, awareness and publicity – Foster continuing and increased understanding and awareness amongst landowners, and managers of management practices that encourage wildlife and maintain earth science features of sea cliffs and slopes. Foster increased understanding and awareness by the general public and decision-makers of the importance and need to conserve sea cliff and slope, the pressure it faces, and ways in which it can be conserved and enhanced.

Isle of Wight Biodiversity Action Plan Wetlands Habitat Action Plan (2011):

The objectives highlighted below which are covered within this action plan relate specifically to different habitat and species types within the Isle of Wight.

- **Coastal Floodplain & Grazing Marsh:** 'Maintain the current extent and improve the condition of approximately 558ha of floodplain & grazing marsh'
- **Reedbeds:** 'Maintain the current extend and improve the condition of approximately 152ha of reedbeds and initiative the restoration of 1,500ha by 2015'
- **Fens:** 'Maintain the current extent and improve the condition of approximately 87ha of fen habitat'
- **Water Vole:** 'Maintain the current extent of the population within each of the catchments where they are recorded and improve the habitat to link up fragmented populations' – Water Voles could be adversely affected by saline incursion;
- **Great Crested Newt:** 'Maintain the current extent of the population and maintain and restore the habitat so as to maintain viable populations'.

Western Yar Estuary Management Plan (2004) and Guiding Principles (2014):

44 Isle of Wight Biodiversity Action Plan Maritime Cliffs and Slopes Habitat Action Plan (2002) http://www.wildonwight.co.uk/publications/haps/MCSHAP.pdf

The Western Yar Estuary Management Plan (WYEMP) was developed through extensive local consultation and engagement in 1998 and then reviewed and revised by the local stakeholder group in 2004. Underpinning the management plan is the principle of safeguarding the future of the Western Yar estuary by using its resources wisely and in a sustainable way. The importance of maintaining this approach led to the extraction of the main policies and objectives. In 2014 these were published as the Guiding Principles of the Western Yar Estuary Management Plan, detailed below:

- Maintaining the Character: Recognition that the Western Yar is generally in good condition and that the special character of the area should be maintained.
- Physical Processes: Allowing the physical and other natural processes within the Western Yar to function with the minimum of human modification.
- Encouraging a Strong Local Economy: To encourage a strong economy in Yarmouth, the Harbour and the estuary hinterland.
- Landscape Quality: Enhancing the beauty of the estuary both in terms of natural features and historic buildings by ensuring that future development reflects the local character of the area.
- Pollution: To ensure that the environment of Western Yar is safe, clean and pollution free.
- Access and Public Rights of Way: Encourage and promote public enjoyment of the estuary through careful provision and management of access and rights of way.
- Recreation: Maintain the recreational use of the Western Yar through voluntary systems of management and co-operative agreements. Intervention or regulation will only be used when the voluntary approach proves ineffective.
- Safety and Emergency Planning: Ensure that the Western Yar is a safe place.
- Communication and Raising Awareness: Improve communication between different users of the estuary and ensure that appropriate and high quality information on the EMP is available.
- Data Management: Identify and prioritise research and information needs.

Medina Estuary Management Plan (2000)[45]*:*

- To minimise the adverse impact of development on the nature conservation resource;
- To maximise opportunities to conserve and enhance the nature conservation resource;
- To ensure that appropriate protection is given to designated areas of the estuary;
- To minimise disturbance to estuarine habitats and wildlife in recognition of international obligations;
- To monitor and conserve the saltmarsh habitat and where appropriate encourage opportunities for recreation; and,
- To achieve coordinated, comprehensive information about the nature conservation resource.

9.3 Environmental Baseline

There are a number of international, national and local habitat designation and nature conservation sites within the study site. Table 9-1 highlights these sites which could be affected by the implementation of the Strategy, outlines their condition/status and the reason behind their designation.

45 Medina Estuary Management Plan (2000) http://www.wildonwight.co.uk/publications/MEMP.pdf.pagespeed.ce.sRAGGU-MNn.pdf

There are a number of threats to the integrity of intertidal habitats which are apparent within the Solent as highlighted by the Solent Coastal Habitat Management Plan and by Covey and Laffoley (2002)[46] which include:

- The continuing erosion of foreshores and Spartina dieback;
- The loss of coastal habitat as a result of development;
- Coastal squeeze;
- Agriculture and diffuse pollution contributing to eutrophication;
- Overfishing;
- The deterioration of water quality as a function of pollution and bioaccumulation; and,
- Dredging.

Ultimately these threats lead to the projection made by the Solent Coastal Habitat Management Plan that between 58-75% of existing saltmarsh will be lost by 2100 and be replaced by mudflats, largely as a result of coastal squeeze.

PDZ6: West Wight (SMZ 1,2 and 3)

The coastline from Freshwater Bay and around the north side of the Needles includes an extensive tide-exposed Cretaceous Chalk reef that supports a diverse range of species both in the intertidal and subtidal, whilst the cliffs above support ecologically important Cretaceous Chalk plants, lowland heath, acid grasses and invertebrates. There are extensive seagrass beds throughout this area.

The reefs are some of the most important subtidal Cretaceous Chalk reefs in Britain, with the only known Cretaceous Chalk subtidal caves in the UK. The western coastline is geologically important in places, particularly at Colwell Bay. The headland west of Fort Victoria comprises coastal vegetated cliffs, secondary woodland, grassland and intertidal sand and single beach. The Western Yar estuary is relatively natural with little development and therefore supports a wide range of coastal and estuarine habitats, particularly extensive saltmarsh and intertidal mudflats that support nationally important overwintering populations of wildfowl and waders and important breeding populations of terns, gulls and waders. To the east of the estuary the landward extent of the saltmarsh is constrained by the old railway embankment. Surrounding the saltmarshes are areas of low lying grazing marsh communities that provide high tide roosts for nationally important breeding birds.

This area straddles four European sites (SPA and SAC), one international site (Ramsar site), and a number of national designations (SSSIs) and a number of local designation such as SINCs. On the south side of the peninsular there are two international designations. The *South Wight Maritime SAC* extends from the south-eastern extent of Freshwater Bay to Hatherwood Point (Headon Warren), whilst the *Isle of Wight Downs SAC* that is designated for the grasslands, vegetated sea cliffs and Heathland, includes the eastern headland at Freshwater Bay and the cliffs along Tennyson Down to the Needles. The latter SAC has a SSSI 'Headon Warren & West High Down' that protects the cliffs of Tennyson Down and Headon Warren under the Habitats Regulations. There are no international designations from Hatherwood Point along Totland Bay and Colwell Bay to Sconce Point; however some of this coastline is protected by SSSIs. Headon Warren & West High Down SSSI extends to the built up area south of Totland Bay, whilst Colwell Bay SSSI protects the geological features of the cliffs from the north side of Totland Bay Pier to south of Fort Albert.

46 Covey, R. & Laffoley, D.d'A. (2002). *Maritime State of Nature Report for England: Getting onto an Even Keel.* Peterborough, English Nature.

On the northern coastline of the stretch between Yarmouth and Freshwater there are components of a number of international sites, the *Solent Maritime SAC* and the *Solent and Southampton Water SPA and Ramsar sites.* The area of all three designations includes the mudflats and saltmarsh of the Western Yar estuary, including Norton Spit that extends across the mouth, to the road at Freshwater near Afton Manor. The Solent Maritime SAC also includes the intertidal and subtidal areas from Sconce Point to Bouldnor. The SPA and Ramsar sites include the flood zone areas of two streams feeding into the Western Yar estuary. There is one component SSSI for these international designations, the Yar Estuary SSSI, which protects the estuary, including the intertidal and related brackish wetland habitats, which extends to the tidal limit at Causeway Road. The SSSI also includes the small sand dune system at Norton Spit. There is also a SSSI that protects the freshwater marshes, fens and reedbeds along the valley of the Western Yar, called the Freshwater Marshes SSSI. Furthermore, there are a number of SINCs that contain a variety of species including National BAP species; these include Freshwater Bay Cliffs SINC and Fort Victoria SINC.

PDZ7: North-west Coastline (SMZ 4)

This coastal stretch encompasses a wide range of coastal habitats such as soft cliffs, intertidal sandflats, estuarine mudflats, saltmarsh and coastal grazing marsh. There are extensive seagrass beds throughout this area.

The western extent of the zone comprises predominantly shingle beach, backed by unstable soft cliffs known as the Bouldnor and Hamstead cliffs, and is littered by debris from cliff failures. The area on top of the cliffs is mostly covered in mature oak woodland, whilst the instability of the cliffs ensures a mixture of broadleaved woodland, scrub and early pioneer plants. The central area of this stretch is dominated by the large natural undeveloped inland estuary, known as Newtown Estuary, which is the only National Nature Reserve (NNR) on the Island and lies in the area designated as a SPA, Ramsar Site and SAC. The estuary consists of a number of inundated small rivers and forms an integral part of the Solent's estuarine system. The habitats within the estuary range from woodland, ancient coastal grazing meadows, mudflats and marshland, and support nationally important and threatened wildlife. The estuary is a particularly significant feeding and over-wintering ground for waders and other wildfowl. The entrance of the estuary is dominated by a large expanse of intertidal sand and shingle stretching along the coastline to the east as far as Burnt Wood. The area backing the sandflats comprises low maritime cliffs backed by agricultural land that rises to over 40 metres high near Burnt Wood, where the cliffs are soft and slumping. East of the woodland is Thorness Bay, which is predominantly intertidal mudflats interspersed with rocky outcrops and ledges comprising of Bembridge Limestone, and two small areas of brackish marshland with club rush and saltmarsh. An area of saltmarsh habitat creation is apparent at Thorness Bay.

The coastline of this area is almost completely undefended at present and sits within three international designations, the *Solent Maritime SAC, the Solent and Southampton Water SPA and Ramsar sites*. The entire coastline for this section is part of the SAC, and includes estuaries, saltmarsh and *Spartina* swards for which it is designated. The Solent and Southampton Water SPA and Ramsar sites protect the entirety of Newtown Estuary, the coastline around the entrance and the coastline to the east until Gurnard Ledges. The extent of the SPA goes beyond that of the SAC and Ramsar sites, protecting the entire flood zone, and includes areas of coastal grazing, in particular to the east of the estuary. Between Bouldnor and Gurnard Luck there are also three SSSIs (Bouldnor and Hamstead Cliffs, Newtown Harbour and Thorness Bay) and a number of coastal SINCs (e.g. Bouldnor Copse and Hart's Farm Meadows) that support a variety of habitats including BAP priority habitats (e.g. intertidal mudflats and wetland areas) with a diverse number of national BAP priority species, as well as Red Data book species and nationally scarce and locally important species.

PDZ1: Cowes and Medina Estuary (SMZ 5 and 6)

The western headland beyond Gurnard and Cowes is predominantly built up and backed by woodland, scrub and grassland, with an area of low lying land flanking the Gurnard Luck stream. The East Cowes headland is comprised of sandflats, with mudflats and seagrass beds at the mouth of the estuary, whilst the narrow Medina Estuary comprises mudflats and wetland habitats such as saltmarsh. The majority of the estuary is designated as an SAC.

There are two internationally designated areas along the Old Castle Point (East Cowes) to Gurnard Luck stretch of coastline. The Solent Maritime SAC covers the entirety of this coastline, running from Sconce Point west of Yarmouth to the eastern end of Osborne Bay (covering 11,325ha). South of the built up areas of Cowes and East Cowes, the Medina Estuary is designated as part of the Solent and Southampton Water SPA and Ramsar site and as a SSSI (the Medina Estuary SSSI). The SPA protects a number of internationally important wildfowl, wading and overwintering birds that use the estuarine mudflat areas for feeding.

Table 9-1 Condition of Designated Areas that Could be Affected by the Strategy

Site	Condition/Status	Reason for Designation
The Solent Maritime SAC	Designated SAC	Annex 1 Habitats are the primary reason for selection of this site: Estuaries, Spartina swards, and Atlantic salt meadows[47].
Solent and Southampton Water SPA and Ramsar site	Designated SPA and Ramsar Site	Supports populations of European Importance such as: Tern species, Brent Geese, Godwit, Plover and Teal[48].
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[49].
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[50].
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[51].

47 http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUcode=UK0030059

48 http://jncc.defra.gov.uk/page-2037

49 http://www.sssi.naturalengland.org.uk/citation/citation_photo/1000578.pdf

50 http://www.sssi.naturalengland.org.uk/citation/citation_photo/1004338.pdf

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

Table 9-1 Condition of Designated Areas that Could be Affected by the Strategy		
Site	**Condition/Status**	**Reason for Designation**
		Newton Estuary is also part of the area designated as a SPA, Ramsar site and SAC.
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[52]. 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[53]. There is an area of saltmarsh habitat creation within Thorness Bay.
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 healthland vegetation
Hart's Farm Meadows SINC	N/A	Coastal and floodplain grazing marsh which also acts as a high tide roost.
South Wight Maritime SAC	Designated	Annex I habitats are a primary reason for the selection of the site: Reefs, Vegetated Sea Cliffs of the Atlantic and Baltic Coasts,

52 http://www.sssi.naturalengland.org.uk/citation/citation_photo/1004233.pdf

53 http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S2000022&SiteName=Thorness Bay&countyCode=&responsiblePerson=

Table 9-1 Condition of Designated Areas that Could be Affected by the Strategy		
Site	**Condition/Status**	**Reason for Designation**
		Submerged/partially submerged sea caves[54].
Isle of Wight Downs SAC	Designated	Annex I habitats are a primary reason for selection of this site: Vegetated sea cliffs of the Atlantic and Baltic Coasts, European Dry Heaths, Semi-natural dry grasslands and scrubland facies on calcareous substrates. Annex II species are a primary reason for selection of this site: Early gentian *(Gentianella anglica)*[55].
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[56].
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[57].
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[58].
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

54 http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC.asp?EUCode=UK0030061

55 http://jncc.defra.gov.uk/ProtectedSites/SACselection/sac.asp?EUcode=UK0016254

56 http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1000546&SiteName=Headon Warren and West High Down&countyCode=&responsiblePerson=

57 http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1004379&SiteName=Colwell Bay&countyCode=&responsiblePerson=

58 http://www.sssi.naturalengland.org.uk/citation/citation_photo/1000838.pdf

Table 9-1 Condition of Designated Areas that Could be Affected by the Strategy		
Site	**Condition/Status**	**Reason for Designation**
		(Phragmites australis) interspersed with blocks of sallow *Salix* species[59]. A portion of the marshes is also designated as a local nature reserve.
Freshwater Bay Cliffs SINC	N/A	Contains a variety of species including National Biodiversity Action Plan species.
Fort Victoria SINC	N/A	As above.
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[60].
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[61].
Springhill/Western Wood SINC	N/A	Located within the North-eastern woods area of the Isle of Wight[62].
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[63].
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

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

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

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

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

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

Table 9-1 Condition of Designated Areas that Could be Affected by the Strategy		
Site	**Condition/Status**	**Reason for Designation**
		the best peat and clay exposures in the region[64].
Solent and Dorset Coast pSPA	Designation Proposed (currently at consultation)	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. Note that should the SPA designation be confirmed, the environmental studies of the Strategy will be updated to consider in more detail potential impacts on the new designation.

Figure 9-1 shows international nature conservation designations whilst Figure 9-2 shows national and local nature conservation designations.

Fisheries

The Solent and Southampton Water and associated estuaries are key environments on the migratory route for both Atlantic Salmon and Sea Trout. Similarly, watercourses on the West Wight are known to support resident wild Brown Trout. These species are protected by a number of legislative and policy guidelines such as the Sea Fish (Conservation) Act 1967 and Amendments. The seasonal nature of these species should be considered when assessing the impacts which the Strategy may have upon local fish populations, particularly as a result of the sensitivity of these populations to changes in water quality. In addition to these species, Eels should also be considered under the Eel Regulations 2009 which aims to aid in the recovery of the stock of European Eel.

64 http://www.wildlifetrusts.org/MCZ/yarmouth-to-cowes#status

9.4 Key Environmental Issues

The key environmental issues for West Wight in regards to biodiversity have been identified as:

- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites;
- The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation;
- It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species;
- There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.
- By 2100 it is projected that between 58-75% of existing saltmarsh will be lost;
- These threats will be exacerbated by climate change;
- There are a number of management plans, programmes and policies which have the aim of protecting and enhancing the Isle of Wight biodiversity; and,
- The implementation of the Coastal Strategy is likely to offer opportunities for the protection of designated sites and prevent their inundation/erosion and complement the suite of flood and water management resources which are already available.

9.5 Appraisal Findings

9.5.1 Strategy Management Zone 1 (W1) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

Minor, beneficial impacts are expected across SMZ1 as a result of the preferred option.

A 'Do Nothing' scenario will allow features of conservation interest to evolve naturally. Erosion will continue to act upon the most important subtidal chalk reefs in Britain and the only known chalk subtidal caves in the UK, both of which are features of the South Wight Maritime SAC. Natural evolution of various habitats will also be facilitated including grasslands, vegetated sea cliffs and heathland and there will be no adverse impacts upon designated sites. At Headon Warren, the undefended and natural section of coastline would continue to function in line with natural processes by slope reactivation and retreat caused by erosion and water in the ground, with no adverse effects on designated sites.

9.5.2 Strategy Management Zone 2 (W2-W7) (SMP - PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

Minor, beneficial impacts are expected across SMZ2 as a result of the preferred option.

The central section of Colwell Bay is generally undefended and rapid coastal erosion and cliff retreat will continue under a 'Do Nothing' scenario. This will impact on the Colwell Bay SSSI features but maintain the important geological exposures from the north side of Totland Bay Pier to the south of Fort Albert.

Continued erosion along the Fort Victoria Country Park area would supply sediment both to the beaches in this area and potentially to the frontages to the north-west. This would support the important nature conservation values of the area (namely vegetated cliffs, which form a feature of the Solent Maritime SAC, Solent and Southampton Water SPA and Ramsar sites).

9.5.3 Strategy Management Zone 3a – (W8, W9 and W15-W17) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

The impacts upon biodiversity as a result of the implementation of the preferred option are likely to be mixed. However, overall minor, beneficial impacts are anticipated. Maintenance of current defences would prevent both the migration and breach of designated SAC features. However, the maintenance of these defences would result in natural processes becoming constrained in some areas.

9.5.4 Strategy Management Zone 3b – (W10, 13, W14) (SMP – PDZ6)

Whilst no significant or minor adverse impacts are expected across SMZ 3b in regards to biodiversity, compensatory habitat of 31ha of grazing marsh will be required should the managed realignment of Thorley Brook commence.

9.5.5 Strategy Management Zone 3c – (W11 and W12) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

Maintenance of defences could lead to minor positive impacts by protecting biodiversity in the area.

9.5.6 Strategy Management Zone 4 – (W18-W20) (SMP – PDZ7)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

A number of minor effects are anticipated in SMZ4 in regards to biodiversity as a result of the implementation of the preferred plan. Whilst these impacts are mixed they are generally seen as positive overall.

At Hamstead, increasing erosion and higher winter rainfall is expected to promote a significant increase in coastal landsliding activity. Such activity will provide additional sources of sediment to local beaches. This retreat will allow the nature conservation interest (sea cliffs and reefs associated with Solent Maritime SAC and Solent and Southampton Water SPA/Ramsar).

At Newtown Estuary, the effect of erosion or retreat/roll back of the spits in the first epoch could lead to increased wave penetration with implications for the erosion of saltmarshes and mudflats. Leading into the second epoch, rising sea levels may result in tidal inundation of the National Nature Reserve and increased salt penetration on adjacent farmland with impacts on the bordering woodlands.

The estuary will evolve naturally under the 'Do Nothing' scenario, and in the long term there is potential for gain of saltmarsh and intertidal flats (which support international nature conservation designations) as the coast is allowed to roll back. Changes to other important habitats are expected: coastal grazing marsh and lagoons will be altered as a result of increasing saline intrusion over time and shingle habitat associated with the entrance spits may be lost.

At Thorness Bay, habitats of nature conservation important will also be allowed to evolve naturally.

9.5.7 Strategy Management Zone 5a – (W21, W22) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

The landward coastal grazing marshes would be maintained under this management option, though there would coastal squeeze of the beach as it was constrained from natural roll back by the maintained defences. However, the beach is of poor sediment and ecological quality and would therefore not significantly affect the integrity of the Solent Maritime SAC.

As of the second epoch, the creation of intertidal mudflats and saltmarsh is expected as a result of flooding in the Marsh Road area.

9.5.8 Strategy Management Zone 5b – (W23) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

9.5.9 Strategy Management Zone 6a – (W24, W25, W31) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

9.5.10 Strategy Management Zone 6b – (W26-W28, W30, W32) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

Where short lengths of mainly private defences are maintained to protect properties and assets there will be loss of important estuarine habitats through coastal squeeze, this will affect the integrity of the SAC, SPA, Ramsar and SSSI within the estuary. However, where the defences are allowed to fail, or where the management policy transfers from 'Do Minimum' to 'Do Nothing' over the appraisal period (i.e. ODU W32), there is the potential for habitat gain through natural roll back and for the estuary to function more sustainably. Consequently, whilst effects can be deemed as adverse and beneficial, minor, beneficial impacts are expected overall.

9.5.11 Strategy Management Zone 6c – (W29) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to biodiversity as a result of the implementation of the preferred option.

9.6 Proposed Mitigation

As there are no adverse impacts expected for biodiversity as a result of the implementation of the preferred plan, mitigation measures are not proposed at this stage.

9.7 Proposed Monitoring

Whilst mitigation measures are not proposed by this SEA, a monitoring framework should be implemented to detect a change in condition of nature conservation interests. Potential monitoring methods include biodiversity surveys (at the most appropriate level; landscape, community or species level), habitat surveys and various ecology surveys such as vegetation, mammal and reptile and bird surveys. As detailed in Section 3.8, the following proposed indicators could be utilised:

- Condition and extent of designated sites
- Area of habitat enhanced as a result of flood reduction measures
- Negative impacts on statutory and non-statutory ecological sites as a result of flooding.

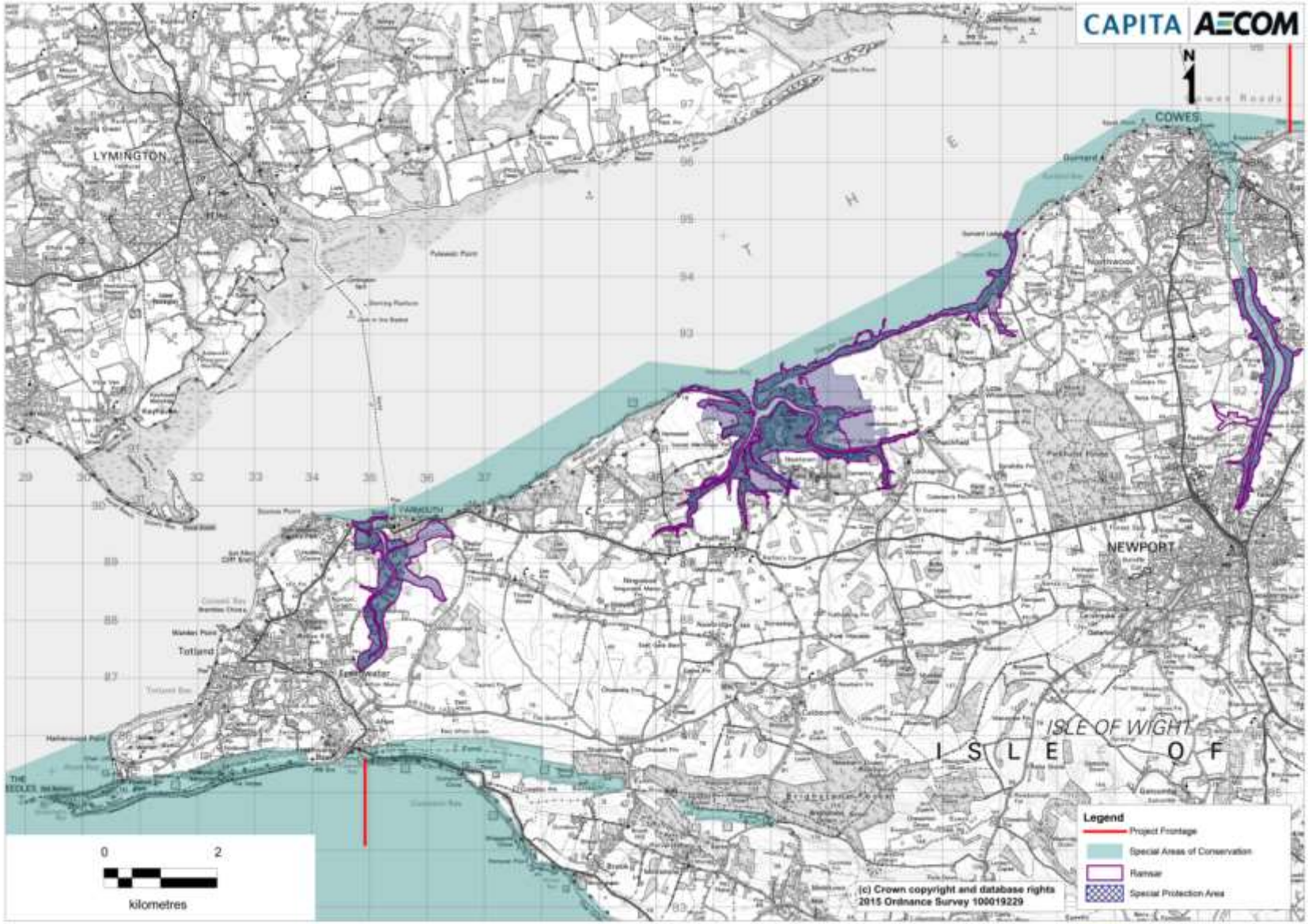


Figure 9-1: International Nature Conservation Designations

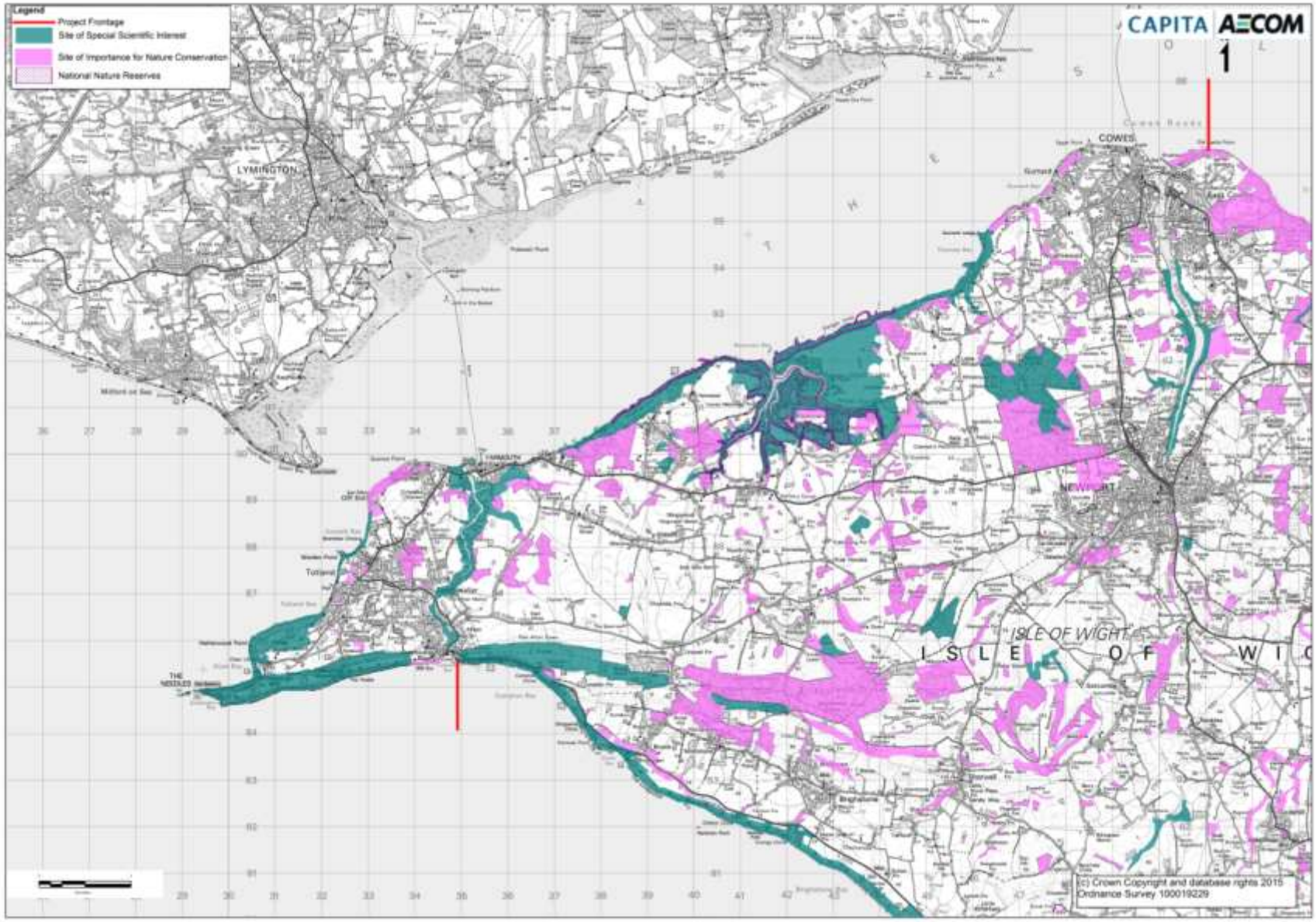


Figure 9-2: National and Local Nature Conservation Designation

10. Cultural Heritage

In order to develop an environmental baseline for the study area a broad definition of the historic environment is useful. As defined by English Heritage the historic environment includes 'areas, buildings, features and landscapes with statutory protection (designated heritage assets), together with those parts of the historic environment which are locally valued and important (non-designated heritage assets) and also the historic character of the landscape, townscape and seascape'.

10.1 Policy Context

Individual features within the historic environment are afforded protection through national legislation e.g. through the listing of buildings or scheduling of monuments. However, such measures only protect the most valued assets at the national level and therefore locally important assets require separate consideration.

The main vision of the Granada Convention[65] is to reinforce and promote policies for the conservation and enhancement of Europe's architectural heritage. It also affirms the need for European solidarity with regard to heritage conservation and is designed to foster practical co-operation among parties. It also establishes the principles of 'European co-ordination of conservation policies' including consultations regarding the thrust of the policies to be implemented. The Valletta Convention[66] is concerned with archaeological heritage. Similarly, the World Heritage Convention called for the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage sites in 1972.

At the national level, the Government White Paper: Heritage Protection for the 21st Century (2007)[67] seeks to put the historic environment at the heart of the planning system. The NPPF recognises that heritage assets are an irreplaceable resource and should be conserved in a manner appropriate to their significance in order that they can be enjoyed for their contribution to the quality of life of current and future generations. Similarly, The Historic Environment: A Force for Our Future (2001)[68] recognises the full potential of the historic environment should be realised and accessible to all.

Cultural heritage remains an important consideration within a number of flood and water management legislative and policy documents. For instance the Flood Risk Regulations (2009)[69] include a requirement to have regard to the desirability of reducing the adverse consequences of flooding for the environment (including cultural heritage). The Flood and Water Management Act (2010)[70] includes a requirement for risk management authorities (including Local Authorities, Highways Agencies and Internal Drainage Boards (IDBs) to contribute towards sustainable development when exercising their flood risk management functions. Associated guidance on this principle includes improving the resilience of the natural,

65 Granada Convention (1985) http://www.coe.int/t/dg4/cultureheritage/heritage/Archeologie/default_en.asp

66 Valletta Convention (1992) http://conventions.coe.int/Treaty/en/Treaties/Html/143.htm

67 Government White Paper: Heritage Protection for the 21st Century (2007) https://www.gov.uk/government/publications/heritage-protection-for-the-21st-century-white-paper

68 The Historic Environment: A Force for Our Future (2001) http://webarchive.nationalarchives.gov.uk/+/http:/www.culture.gov.uk/reference_library/publications/4667.aspx

69 Flood Risk Regulations (2009) http://www.legislation.gov.uk/uksi/2009/3042/made

70 Flood and Water Management Act (2010) http://www.legislation.gov.uk/ukpga/2010/29/contents

historic, built and social environment to current and future risks, in addition to protecting natural and heritage assets and enhancing the environment where it is most degraded.

The National Flood and Coastal Erosion Risk Management Strategy includes a guiding principle on achieving 'Multiple Benefits' which includes enhancing and protecting cultural heritage and avoiding damage to the historic environment.

Locally, the Isle of Wight has mechanisms in place to ensure the protection and enhancement of the island's heritage as illustrated by the Isle of Wight Heritage at Risk in the Medina Valley[71] report which highlighted the built heritage assets which may be at risk of deterioration, the findings of which can be found in the environmental baseline.

Similarly, the Isle of Wight Core Strategy (Policy SP5 and DM11), Shoreline Management Plan, Environmental Mitigation Study[72] and other planning policy documents acknowledge the importance of protecting and enhancing local heritage, largely in reference to the Isle of Wight's Heritage Coast.

Core Strategy Policy SP5 states that the Council will support proposals which protect, conserve and/or enhance the islands historic environment and that development, where appropriate and practical, should contribute to environmental conservation and enhancement. Development which has a demonstrable adverse impact on the historic environment should be avoided and an indication within proposals as to how they have considered the historic environment must be apparent.

The Isle of Wight Historic Environment Action Plan (HEAP) (2008)[73] provides an overview of the Island's historic environment and includes aims, objectives and actions which encourage the protection and enhancement of heritage assets. The overarching aim of the HEAP is to provide community understanding, conservation, and management of the historic environment whilst assisting in the development of strategic planning policy[74]. A separate HEAP was produced in 2008 for the West Wight Cretaceous Chalk Downland which is valued for its significant historic landscape features[75].

Whilst the Isle of Wight AONB Management Plan (2014-2019)[76] largely relates to landscape protection and enhancement, the plan does consider the historic environment and sets out a number of objectives relating to the conservation of heritage, as detailed below under 'policy objectives'.

71 Heritage Assets at Risk in the Medina Valley (2014) http://www.iwight.com/Residents/Environment-Planning-and-Waste/Planning/Conservation-and-Design/Heritage-Assets-At-Risk-HAAR

72 http://www.coastalwight.gov.uk/studies.htm

73 The Isle of Wight Historic Environment Action Plan (2008) http://www.iwight.com/azservices/documents/1324-IsleofWightHEAPOverview_2013.pdf

74 https://www.iwight.com/Residents/Libraries-Cultural-and-Heritage/Heritage-Service/Archaeology/Historic-Landscapes-on-the-Isle-of-Wight

75 West Wight Chalk Downland HEAP (2008) https://www.iwight.com/azservices/documents/1324-WestWightChalkDownlandHEAP_2013.pdf

76 Isle of Wight AONB Management Plan (2014-2019). Available at: http://wightaonb.org.uk/partnership/wight-aonb-management-plan-2014-2019/

10.2 Policy Objectives

World Heritage Convention (1972)[77]*:*

- Calls for the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage sites.

The Convention for the Protection for the Architectural Heritage of Europe (The Granada Convention):

- Reinforces and promote policies for the conservation and enhancement of Europe's heritage.

The European Convention on the Protection of Archaeological Heritage (The Valetta Convention)[78]*:*

- Makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies. It is concerned in particular with arrangements to be made for co-operation among archaeologists and town and regional planners in order to ensure optimum conservation of archaeological heritage.

Ancient Monuments and Archaeological Areas Act (1979)[79]*:*

- Provides for nationally important archaeological sites to be statutorily protected as 'scheduled ancient monuments' (now Scheduled Monuments).

Planning (Listed Buildings and Conservation Areas) Act (1990)[80]*:*

- Provides specific protection for buildings and areas of special architectural or historic interest.

English Heritage's 'Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment'[81] highlights a number of environmental protection objectives related to the protection and enhancement of the historic environment and these include:

- Protect, enhance and manage the character and appearance of landscapes/townscapes, maintaining and strengthening local distinctiveness and sense of place;
- Protect, manage and, where necessary, improve local environmental quality;
- Achieve high quality and sustainable design for buildings, spaces and the public realm sensitive to the locality;
- Minimise waste and encourage the sustainable use of natural resources by reusing existing buildings; and,
- Promote appropriate energy efficiency and energy generated from renewable energy resources.

Isle of Wight Heritage at Risk in the Medina Valley

77 World Heritage Convention (1972) http://whc.unesco.org/en/conventiontext

78 Valetta Convention http://conventions.coe.int/Treaty/Commun/QueVoulezVous.asp?NT=143&CM=1&CL=ENG

79 Ancient Monuments and Archaeological Areas (1979) Act http://www.legislation.gov.uk/ukpga/1979/46

80 Planning (Listed Buildings and Conservation Areas) (1990) http://www.legislation.gov.uk/ukpga/1990/9/contents

81 English Heritage's 'Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment' http://www.english-heritage.org.uk/publications/strategic-environ-assessment-sustainability-appraisal-historic-environment/

Whilst the report does not state explicit policy objectives several recommendations are made for further works which promote the protection of priority heritage assets which are deemed at risk which include:

- Ongoing monitoring through the Island Plan;
- Stakeholder engagement with heritage owners; and
- Further consideration to be given to developing bespoke policy-led approaches to those buildings being identified as being most at risk.

Isle of Wight Core Strategy[82] Policy DM11: The Historic and Built Environment

Policy DM11 largely relates to the conservation and enhancement of the special character of the island's historic and built environment, as such development proposals are expected to:

1. Relate to the continued use, maintenance, rescue/refurbishment, repair and re-use of heritage assets and historic places, especially where identified as being at risk, or likely to become at risk;
2. Relate to the conservation, enhancement and enjoyment of the island's heritage assets and public realm; and
3. Be informed by sufficient evidence to reveal impacts upon the significance of heritage assets and their settings which may include the Council's Conservation Area Appraisals and Management Plans and the Local List Supplementary Planning Document.

Similarly to policy SP5, any development which is shown to have an adverse impact upon the environment should be resisted.

Isle of Wight AONB Management Plan (2014-2019):

The Isle of Wight AONB Management Plan contains a number of objectives relating to the protection and enhancement of heritage assets, particularly the heritage coastline. Objectives relating to the heritage coastline include:

- To conserve, protect and enhance the natural beauty of the coasts, including the terrestrial, littoral and marine flora and fauna, and their heritage features of architectural, historical and archaeological interest;
- To maintain and improve (where necessary) the environmental health of inshore waters affecting Heritage Coasts and their beaches through appropriate works and management measures; and,
- To facilitate and enhance their enjoyment , understanding and appreciation by the public by improving and extending opportunities for recreational, educational, sporting and tourist activities that draw on, and are consistent with, the conservation of their natural beauty and the protection of their heritage features.

10.3 Baseline Review

PDZ6: West Wight (SMZ 1, 2 and 3)

82 Isle of Wight Core Strategy (2012) http://www.iwight.com/azservices/documents/2776-Core-Strategy-Adopted-March-2012-updated-web-links-May-2013-with-cover.pdf?bcsi_scan_AB11CAA0E2721250=0&bcsi_scan_filename=2776-Core-Strategy-Adopted-March-2012-updated-web-links-May-2013-with-cover.pdf

There are 337 monument records in the coastal and estuarine erosion/flood areas, many of which are focused on the Cretaceous Chalk headland and represent human history back to the Bronze Age. On West High Down and Tennyson Down are 5 Scheduled Monuments including a Neolithic Mortuary Enclosure, Bronze Age Barrows, the Needles Battery sites and the High Down Rocket Test Site. . Yarmouth Castle, built by Henry VIII to defend the shore, is also a Scheduled Monument. The constant human occupation and historic development of the West Wight area has led to a wealth of historically important buildings in the towns and villages close to the coast including 1 Grade I listed church, 7 Grade II* listings and 58 Grade II listings. Freshwater Bay and Yarmouth are also Conservation Areas.

Access to the Western Solent for shipping has resulted in much of this stretch of coastline being used for military defence, leaving many historic military features. The marine area surrounding this area has a notorious history of shipwrecks with 122 recorded shipwrecks and two Protected Wreck Sites. Also within the area of the Needles are the remains of 8 air wrecks which are now Military Remains Protected Places.

PDZ7: North-west Wight (SMZ 4)

This PDZ contains two Scheduled Monuments, Bouldnor Battery, constructed in 1938 and the remains of the medieval town of Newtown. There are numerous records of finds of prehistoric implements from the intertidal zone and eroding cliffs, including a large number of Mesolithic flint picks and tranchet axes. At Bouldnor a substantial scatter of late Iron Age and Roman pottery has been found on intertidal gravel banks and a medieval antler working site was excavated from the intertidal silts in the early 1970s.

Offshore is the internationally important site of Bouldnor underwater cliff, with its extensive palaeoenvironmental deposits and evidence for human occupation of Mesolithic date at c -11.5m OD.

The eastern spit of Newtown Estuary has structures and finds that have been radiocarbon dated, producing dates in the Late Neolithic to Early Bronze Age, Early Bronze Age, Middle Iron Age, and Late Iron Age to Roman periods. Newtown Marsh, to the north of the medieval town, was reclaimed from the sea between 1656 and 1768 and surrounded by a clay bank. This reclamation may have been carried out in two stages as there are signs of an inner embankment as well as the outer embankment shown on a map of 1768. The primary purpose of the reclamation may have been either salt production or the creation of extra grazing land. The unpublished Ordnance Survey of c1800 shows salt pans inside the embankment, facing onto Clamerkin Lake. In Shalfleet there is a Grade II* Listed Building, Shalfleet Manor, which is one of the original Domesday Manors on the Island. Newtown and Shalfleet are also Conservation Areas.

The coast between Brickfield Farmhouse and Gurnard is rich in archaeological and palaeoenvironmental features. Prehistoric flint and stone implements have been recovered from the intertidal zone throughout the unit, with concentrations around Saltmead, in Thorness Bay and Gurnard Cliffs. Roman material including pottery and building material has been recorded at locations throughout the unit, including a Roman villa at Gurnard which was excavated in the 1860s, now eroded, and a possible pottery kiln at Burntwood. Thorness Bay has been recognised as being of high archaeological importance, including the remains of where the PLUTO pipeline came ashore, palaeoenvironmental deposits including organic silts and peats and recumbent trees, post alignments, hurdles and other wooden structures radiocarbon dated to the late Bronze Age, Iron Age, Roman and post medieval periods. There are numerous records of prehistoric implements from the bay, and midden deposits of Roman and Medieval date have been recorded.

PDZ1: Cowes and Medina Estuary (SMZ 5 and 6)

This area contains 269 monument records, 60 Grade II listed buildings and 1 Grade II* listed buildings within the coastal zone. There are Conservation Areas in Cowes, East Cowes and Newport and areas of the defences including Cowes Parade seawall are of historic interest.

The Medina Estuary is a deep river valley which was flooded by sea level rise during the past 10,000 years. This is known as a ria estuary. There is a suite of terraces relating to the Pleistocene course of the River Medina. The nationally important Middle Palaeolithic site at Great Pan Farm is located upon one of these terraces and there is the potential for other, as yet unrecorded, Palaeolithic sites on the lower terraces nearer to the present river. The intertidal zone contains palaeo-environmental deposits both within and at the mouth of the estuary.

In the marine-scape is Cowes Roads, an area that has eight listed shipwrecks ranging from Post Medieval to the 20th Century. There are an additional seven wrecks recorded along the project frontage.

Designated Heritage Assets (summary for the Strategy area):

- 8 Scheduled Monuments including the Neolithic Mortuary Enclosure, Bronze Age Barrow and the Needles Battery sites;
- 1 Grade I Listed Building;
- 118 Grade II Listed;
- 9 Grade II* Listed Buildings including Shalfleet Manor (one of the original Domesday Manors on the Island); and,
- 7 Conservation Areas – Including Freshwater Bay, Yarmouth, Newtown and Shalfleet.

Figure 10-1 shows the heritage assets apparent within the study site.

A number of West Wight's Designated Heritage Assets are shown to be 'At Risk' by Historic England's Heritage At Risk Register[83] including:

- Hammerhead Crane, Thetis Road, West Cowes (Grade II* Listed) - Structural (rapid deterioration and loss of fabric) reasons for designation;
- Church of St Mary, Church Road, Cowes (Grade II* Listed) - Structural (slow decay) reasons for designation; and,
- Bouldnor Battery, Shalfleet, (Scheduled Monument - deterioration - in need of management) - Structural (rapid deterioration and loss of fabric) reasons for designation.

The potential for undiscovered / undesignated archaeology and preserved organic and palaeo-environmental remains should also be considered when implementing measures and actions outlined within the future Strategy. Many scheduled monuments and undesignated heritage assets may be located on stretches of coast with a 'Do Nothing' preferred option and these features may be affected as the undefended coastline evolves naturally in the future.

10.4 Likely Future Conditions

There is the potential for future pressures upon West Wight's heritage assets such as development pressures and coastal squeeze, sea-level rise and coastal erosion. These

83 https://content.historicengland.org.uk/images-books/publications/har-2015-registers/se-har-register2015.pdf/

pressures are likely to be exacerbated over time and as a result of climatic change and associated impacts. Whilst a number of heritage assets are already at risk from structural deterioration it is unlikely that such assets will be compromised further by the issues related to the coastal Strategy, firstly as their 'at risk' designation is not related to flood and water management and secondly as a result of the extensive protection offered at the international, national and local scale. Therefore, if it is practicable and resources allow, it is potentially more likely that the quality of heritage assets will be enhanced over time as a result of increased protection from flooding in the areas with a Hold the Line shoreline management policy. Elsewhere, historic (designated or undesignated) assets on the undefended coast with a No Active Intervention policy are likely to remain at risk as natural evolution of the coast continues. Where managed realignment is proposed (e.g. Thorley Brook), this may have an adverse impact on buried archaeology within the area that will revert to intertidal environments.

10.5 Key Environmental Issues

The key environmental issues for cultural heritage along the West Wight coastline include:

- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight;
- There are a number of heritage assets along the West Wight Coastal Stretch some of which feature on the Heritage at Risk Register, yet not for reasons pertaining to flood and water management;
- These assets must be protected and enhanced wherever possible in order to maintain their integrity and importance;
- There are a number of potential future pressures on heritage assets such as coastal erosion, coastal squeeze, sea-level rise and development pressures;
- The integrity of heritage assets is likely to be maintained through various policy measures such as the Isle of Wight Core Strategy which ensures the protection of the historic environment in regard to new development; and,
- Flood and water management plans programmes and strategies such as the Coastal Strategy are likely to contribute to the protection of heritage assets on developed coastlines through a reduced incidence of flooding and associated impacts such as weathering and erosion.

10.6 Appraisal Findings

10.6.1 Strategy Management Zone 1 (W1) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

Under a 'Do nothing' scenario, erosion will threaten the significant heritage interest of the headland, including the loss and/or damage to the Needles Old Battery Site (SM). Whilst this is significant to the SMZ, this is seen as a minor adverse impact in regards to the entire project frontage. Irrespective of this, mitigation measures are put forward for heritage protection and the iconic landscape derived from such heritage features in Section 10.7. There is additional site of the adjacent New Battery and High Down Test Site which was scheduled in 2015, although this is further from the cliff edge.

10.6.2 Strategy Management Zone 2 (W2-W7) (SMP - PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

The defended section around Fort Albert (Grade II* listed) is protected by a variety of coastal defences which would fail towards the end of the first epoch with no maintenance. Within the second epoch, erosion, simple landslides and occasional deeper-seated failures would occur, but the steel and concrete walls around the Fort itself are in good condition and could survive longer, possibly into the third epoch. At some point the coastal slope will increasingly revert to natural soft cliff with potential destabilisation at the cliff top. This would threaten both the residential use of the Fort and particularly local access.

Whilst this is significant to the SMZ, this is seen as a minor adverse impact in regards to the entire project frontage. Irrespective of this, mitigation measures are put forward for heritage protection and the iconic landscape derived from such heritage features in Section 10.7.

10.6.3 Strategy Management Zone 3a – (W8, W9 and W15-W17) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

The defences from Fort Victoria to Norton would fail within the first epoch or soon in the second epoch. However, as a result of privately funded maintenance to the defence assets being permitted at Fort Victoria (Grade II listed) and Yarmouth Castle it is anticipated that this could mitigate or delay the loss.

10.6.4 Strategy Management Zone 3b – (W10, 13, W14) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

10.6.5 Strategy Management Zone 3c – (W11 and W12) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

Potential for minor beneficial impact in regards to protecting cultural heritage features as a result of the implementation of the preferred option.

10.6.6 Strategy Management Zone 4 – (W18-W20) (SMP – PDZ7)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

A 'Do Nothing' scenario will fail to prevent flooding and impact upon part of Scheduled Monuments (the remains of the medieval town of Newtown, and potentially at Bouldnor Battery in the longer term) and widespread exposure and loss of intertidal archaeological resources such as palaeoenvironmental deposits at the mouth of the estuary. Brickfields farmhouse on the eastern spit will be lost to erosion. Heritage assets in the intertidal zone at Thorness may also be affected.

Whilst this is significant to the SMZ, this is seen as a minor adverse impact in regards to the entire project frontage. Irrespective of this, mitigation measures are put forward for heritage protection and the iconic landscape derived from such heritage features in Section 10.7.

10.6.7 Strategy Management Zone 5a – (W21, W22) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

10.6.8 Strategy Management Zone 5b – (W23) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

The historic built environment of the Cowes waterside will be maintained under the preferred plan and numerous listed buildings would be maintained.

10.6.9 Strategy Management Zone 6a – (W24, W25, W31) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

The historic built environment of the Cowes waterside and quayside will be maintained under the preferred plan and numerous listed buildings would be maintained.

10.6.10 Strategy Management Zone 6b – (W26-W28, W30, W32) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

10.6.11 Strategy Management Zone 6c – (W29) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to cultural heritage as a result of the implementation of the preferred option.

Likely Minor Effects

Under the preferred option, defences will be maintenance in the short and medium term but sea level rise may increase the flood risk over this time period; consequently numerous listed buildings may be adversely affected.

Whilst this is significant to the SMZ, this is seen as a minor adverse impact in regards to the entire project frontage. Irrespective of this, mitigation measures are put forward for heritage protection and the iconic landscape derived from such heritage features in Section 10.7.

10.7 Proposed Mitigation

In order to ensure the protection and enhancement of environmental receptors, a number of proposed mitigation measures are required in regards to cultural heritage. These measures relate to the following heritage assets:

- Needles Battery Site (SMZ1);
- Fort Albert (SMZ2);
- Heritage assets associated with SMZ4 including the medieval town of Newtown and palaeoenvironmental deposits; and,
- Listed buildings associated with SMZ6c.

In April 2015, Historic England produced their document *'Flooding and Historic Buildings'*[84] which provides a framework for protecting and enhancing heritage assets which may be at risk of flooding through the following key stages:

- Establishing flood risk;
- Being prepared for flooding;
- Dealing with a flood; and,
- After a Flood – Minimising flood damage in old buildings;

It is therefore recommended that this guidance is used to develop a management framework for each of the above assets as a collaborative, stakeholder initiative. However, in some instances such as Fort Albert and the Needles Battery Site, the simple development of a management framework will not be sufficient to protect heritage assets in the future. Consequently, it is likely that physical measures would be necessary to offer the required level of protection.

The development of the Coastal Strategy has outlined a lack of availability of funding streams in relation to the protection of the heritage environment. Subsequently it is recommended that private funding is sought and that partnerships are sought between Historic England, Isle of Wight Council and other key stakeholders and RMAs to deliver partnership funding. Such funding could aid in the delivery of PLP measures which may raise the SoP and subsequently reduce flood risks posed to the historical environment (e.g. Fort Victoria).

However, in areas where coastal erosion is the primary concern, flood resilience measures alone will not be effective in protecting and enhancing the historic environment. In such cases, it is likely that further works inclusive of modelling will be required to determine the risks posed to heritage features and the timeframes associated with these risks. From these results, Historic England, Isle of Wight Council and other key stakeholders must agree upon and deliver an appropriate management plan for each area.

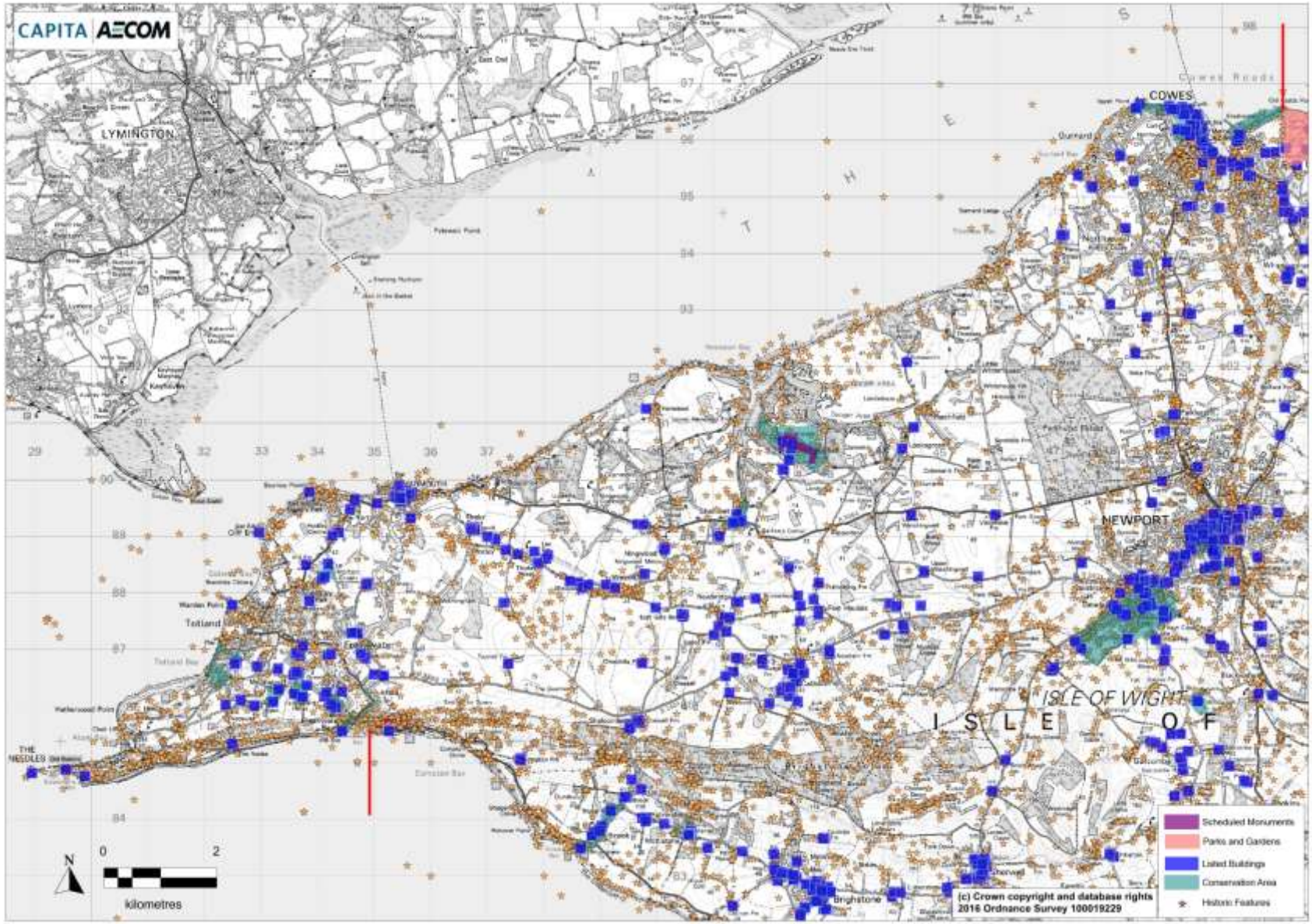
10.8 Proposed Monitoring

A monitoring framework should be implemented to detect a change in condition of nature conservation interests. As detailed in Section 3.8, the following proposed indicators could be utilised:

- Number/area of designated heritage assets at risk of local flooding
- Number/area of Conservation Areas which have changed as a result of the Strategy
- Number of listed buildings on the 'at risk' register at risk from flooding.
- Number of archaeological priority areas at risk of flooding and erosion.

84 Historic England (2015) Flooding and Historic Buildings. https://content.historicengland.org.uk/images-books/publications/flooding-and-historic-buildings-2ednrev/heag017-flooding-and-historic-buildings.pdf/

Figure 10-1: West Wight Heritage Assets



11. Landscape

Landscapes are afforded protection for their intrinsic contribution to the character of an area.

11.1 Policy Context

At the international level, the European Landscape Convention (2000)[85] promotes various methods of protecting and enhancing landscape features, from strict conservation through protection, management and improvement to actual creation.

Nationally, The Natural Environment White Paper (2011)[86] states that a *'healthy, properly functioning environment is the foundation of sustainable economic growth, prospering communities and personal wellbeing'.* The White Paper introduced a number of initiatives including Local Nature Partnerships which are comprised of various stakeholders who work collaboratively to improve the local natural environment.

Similarly to the Natural Environment White Paper, the Urban White paper 'Our Towns and Cities: the Future – Developing an Urban Renaissance' (2000) seeks to promote sustainable development in urban areas in order to make them more attractive for both investment and settlement.

The NPPF sets out how planning should contribute to sustainable development and commits to protect and enhance the quality of the natural environment in both rural and urban areas, partially through the prevention of inappropriate development (paragraph 74) and the designation of Local Green Spaces (paragraph 76 and 77). It is suggested that a high level of protection should be given to most valued landscapes such as those with international designations.

Locally, the Core Strategy's DM12 Policy relates specifically to the protection of the Isle of Wight landscape and seascape. The Policy aims to ensure that all development proposals demonstrate how they have taken account of landscape and seascape features and have identified any potential opportunities for enhancement.

Policy DM13 is also concerned with Green Infrastructure. The importance of Green Infrastructure to the Isle of Wight is reinforced through the development of a Green Infrastructure Strategy. Upon completion the Strategy will identify, deliver, manage and monitor the Green Infrastructure network and provide detailed guidance and delivery mechanisms for Green Infrastructure including the identification of areas of opportunity for expansion or improvements to the network[87]. It is likely that the Strategy will build on the identification of green infrastructure assets as undertaken by Isle of Wight Green Infrastructure Mapping Study.

The Isle of Wight AONB Management Plan (2014-19) documents how the Isle of Wight AONBs will be protected and enhanced in the future and has the following objectives:

- Highlight the distinctive qualities of the AONB;

85 The European Landscape Convention (2000) http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/default_en.asp

86 The Natural Environment White Paper (2011) https://www.gov.uk/government/news/natural-environment-white-paper-discussion-document-record-response

87 http://www.iwight.com/Residents/Environment-Planning-and-Waste/Planning-Policy-new/Supplementary-Planning-Documents/About-1718

- Identify the changes and issues affecting the AONB;
- Present a vision for the future of the AONB as a whole, in light of other national, regional and local priorities;
- Set priorities incorporating specific objectives that will help to secure that vision;
- Clarify the role of partners and other stakeholders, identifying what needs to be done, by whom, and when, in order to achieve the plan's objectives;
- Identify how the objectives and actions will be measures and reviewed; and,
- Raise the profile of the AONB and its purpose.

11.2 Policy Objectives

European Landscape Convention (2000)[88]:

The convention commits the UK to *'recognise landscapes in law as an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity'.*

Planning (Listed Buildings and Conservation Areas) Act (1990)[89]:

The Act provides specific protection for buildings and areas of special architectural or historic interest.

Countryside and Rights of Way Act (2000):

- Create a framework for public access to the countryside;
- Provides greater protection to SSSIs and new arrangements for the management of AONBs,
- Provides for the possibility of Conservation Area Boards for AONBs;
- Management Plans receive a statutory status; and,
- Section 85 requires public bodies to have regard to the purposes of designations of AONBs.

Isle of Wight Core Strategy Policy DM12

- Protect the integrity of international, national and local designations relating to landscape, seascape, biodiversity and geodiversity and the reasons for these designations and the weight given to them and enhance their features of interest where possible;
- Ensure new development avoids both direct and indirect adverse effects upon the integrity of designated sites and, if necessary, provide adequate mitigation measures;
- Promote the maintenance and enhancement of the links between designated sites, especially through the provision of, and/or enhancement to, Green Infrastructure and appropriate local designations;
- Minimise the threats and promote the opportunities arising from climate change on the island's landscape, biodiversity and geodiversity.

Isle of Wight Core Strategy Policy DM13

Similarly to Policy DM12, DM13 relates to development proposals and how green infrastructure assets should be acknowledged, conserved and enhanced within these proposals, which are expected to:

88 European Landscape Convention http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/default_en.asp

89 Planning (Listed Buildings and Conservation Areas) Act http://www.legislation.gov.uk/ukpga/1990/9/section/7

- Protect and enhance the integrity and connectivity of the island's green infrastructure network;
- Provide opportunities to enhance and increase the coverage, connectivity and multi-functionality of the islands green infrastructure network;
- Provide appropriate mitigation for any loss of green infrastructure assets;
- Ensure that development within key regeneration areas delivers appropriate levels of green infrastructure provision; and,
- Ensure that areas which separate key settlements such as the area between East Cowes to Newport are appropriately protected to prevent settlement coalescence.

11.3 Baseline Review

Due to the Isle of Wight's coastal location, seascape as well as landscape is an important consideration. Seascape can be defined as: 'The coastal landscape and adjoining areas of open water, including views from land to sea, from sea to land and along the coastline'.

The Isle of Wight comprises a wide variety of natural, rural and urban landscapes with over 50% of the Island being designated as an AONB and 28 miles of coastline designated as Heritage Coast, as shown in Figure 11-1. The Isle of Wight AONB was designated in 1963 and covers 191km2 in total. The AONB is comprised of five distinct land parcels. The study site encompasses both Tennyson and Hamstead Heritage Coasts.

In common with the Isle of Wight as a whole, the study area has a varied land-use pertaining to a diverse landscape and sense of place. The AONB management plan highlights the following landscape character types stretching from Freshwater to East Cowes:

- Cretaceous Chalk Downs;
- Traditional Enclosed Pasture;
- Northern Coastal Cliffs;
- Harbours and Creeks;
- Northern Woodland; and,
- The Osborne Coast.

The Plan also highlights a 'landscape improvement zone' to the west of the study site which is defined as 'areas of the AONB that have changed as a result of sporadic and urbanising development over time'. Such development results in a decline in landscape character which requires mitigation and enhancement. These areas may be increasingly vulnerable to development pressures.

The historical landscape of the Isle of Wight can be characterised by, and is compatible with that of Hampshire, Surrey and Kent yet encompasses the individual landscape character of the Isle of Wight. Consequently the historic landscape characterisation for the Isle of Wight provides a comparative view of the Isle of Wight's landscape features in comparison with these counties.

The percentage of woodland and particularly heathland on the Isle of Wight is relatively low compared to that of Hampshire and Surrey. Alternatively Cretaceous Chalk hills and downs form a significant component of the Isle of Wight landscape alongside field patterns and enclosure which account for 64% of the Isle of Wight's land use. This reflects the lesser extent of modern settlement growth alongside a smaller percentage of woodland.

The historic landscape characterisation study identified the following historic landscape character areas related to the site:

- West Wight Cretaceous Chalk Downland;
- West Wight Cretaceous Chalk Downland edge and Sandstone Ridge;

- Northern Lowlands;
- Freshwater Isle; and,
- Thorley/Wellow Plain[90].

The West Wight coastline is subject to coastal erosion in areas of 'No Active Intervention' (wherein coastal defences are not implemented) as defined in the Isle of Wight Shoreline Management Plan 2 in 2011.

In addition to coastal erosion, West Wight has also experienced a number of landslides. Most recently at Totland to Colwell a failure occurred along a basal failure plane at approximately -4m OD as a result of excessive volumes of groundwater in cliff structures following above average precipitation levels for winter 2012.

Walkover studies conducted in 2013 by Mott Macdonald showed slope instability with the risk of further slope failures without the implementation of effective mitigation. Economic analysis showed that the most cost-effective option would be to stabilise the entire frontage rather than just the area of the recent landslide [91]. Other examples of landslips include the recent incident at Springhill Wood SINC.

11.4 Likely Future Conditions

There is the potential for increasing development pressures upon the Isle of Wight in the future which could lead to the urbanisation of the landscape. Such pressure is likely to be increased in areas surrounding urban centres and may further exacerbate the challenges faced by landscape improvement zones. However, the implementation of various international, national, regional and local plans, policies and strategies concerned with landscape features is likely to ensure the protection and enhancement of the Isle of Wight's characteristic landscape. For example, the Isle of Wight AONB management plan recommends that new developments should include mitigation and enhancement measures which may benefit landscape improvement zones. This therefore provides an opportunity for landscape enhancement.

Adverse impacts upon landscape and seascape may arise from extreme weather events which have previously led to landslides and slope failures. Shoreline management measures may also alter the landscape character and feature of the study site. However, such change is likely to be beneficial as the Strategy aims to reduce coastal erosion and flooding and hence offers protection for landscape features.

11.5 Key Environmental Issues

The key environmental issues for the Isle of Wight's landscape include:

- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight;
- The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses;
- The majority of the study site is covered by AONB designations and Heritage Coastline;

90 http://www.iwight.com/azservices/documents/2776-Core-Strategy-Adopted-March-2012-updated-web-links-May-2013-with-cover.pdf

91 Mott Macdonald (2013) 'Totland to Colwell Bay Landslide Assessment'

- The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas;
- Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate;
- In areas of 'No Active Intervention' coastal erosion has occurred;
- West Wight has been subject to historic landslides as a result of extreme weather events;
- The development of a Coastal Strategy is likely to be beneficial in reducing coastal erosion and flooding and thereby protecting landscape assets; and,
- The implementation of shoreline management measures such as sea defences may adversely impact upon the environment.
-

11.6 Appraisal Findings

11.6.1 Strategy Management Zone 1 (W1) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

In Alum Bay, cliff erosion would continue throughout the three epochs. These natural processes will maintain the exposure of the coloured sands forming the cliffs at Alum Bay and subsequently maintain this iconic landscape. However, loss and/or damage to the Needles Battery Site (SM) is likely to influence the historic landscape of this SMZ.

Whilst this is significant to the SMZ, this is seen as a minor adverse impact in regards to the entire project frontage. Irrespective of this, mitigation measures are put forward for heritage protection and the iconic landscape derived from such heritage features in Section 11.7.

11.6.2 Strategy Management Zone 2 (W2-W7) (SMP - PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

Similarly to SMZ 1, the potential full/partial loss of Fort Albert from epoch two is likely to adversely affect the iconic, historical landscape.

Whilst this is significant to the SMZ, this is seen as a minor adverse impact in regards to the entire project frontage. Irrespective of this, mitigation measures are put forward for heritage protection and the iconic landscape derived from such heritage features in Section 11.7.

11.6.3 Strategy Management Zone 3a – (W8, W9 and W15-W17) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

11.6.4 Strategy Management Zone 3b – (W10, 13, W14) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

11.6.5 Strategy Management Zone 3c – (W11 and W12) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

11.6.6 Strategy Management Zone 4 – (W18-W20) (SMP – PDZ7)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

A 'Do Nothing' scenario allows for a natural evolution of nature conservation interest and will ensure continued sediment supply and transport pathways. The natural evolution of the coastline will improve landscape character and support AONB features.

11.6.7 Strategy Management Zone 5a – (W21, W22) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

11.6.8 Strategy Management Zone 5b – (W23) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

11.6.9 Strategy Management Zone 6a – (W24, W25, W31) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

11.6.10 Strategy Management Zone 6b – (W26-W28, W30, W32) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

11.6.11 Strategy Management Zone 6c – (W29) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to landscape as a result of the implementation of the preferred option.

11.7 Proposed Mitigation

SMZ 1 and SMZ 2 require mitigation in order to protect their landscape value. However, adverse impacts relating to landscape are only apparent within these SMZs as an indirect result of adverse impacts upon heritage assets. Consequently, mitigation measures relating to heritage should be consulted.

For areas of poor aesthetic quality, or for areas wherein landscape quality may deteriorate, the Isle of Wight Council may wish to consider developing a landscape improvement zone, as defined within the Isle of Wight AONB management plan.

11.8 Proposed Monitoring

A monitoring framework should be implemented to detect a change in condition of landscape character. As detailed in Section 3.8, the following proposed indicators could be utilised:

- Proportion of undeveloped coastline
- Number/area of open spaces at significant risk of local flooding, identified using site specific surface water or ordinary watercourse flood modelling
- Number of measures that include enhancements to open spaces and recreational areas
- Area of enhanced landscape and green infrastructure as a result of flood reduction measures

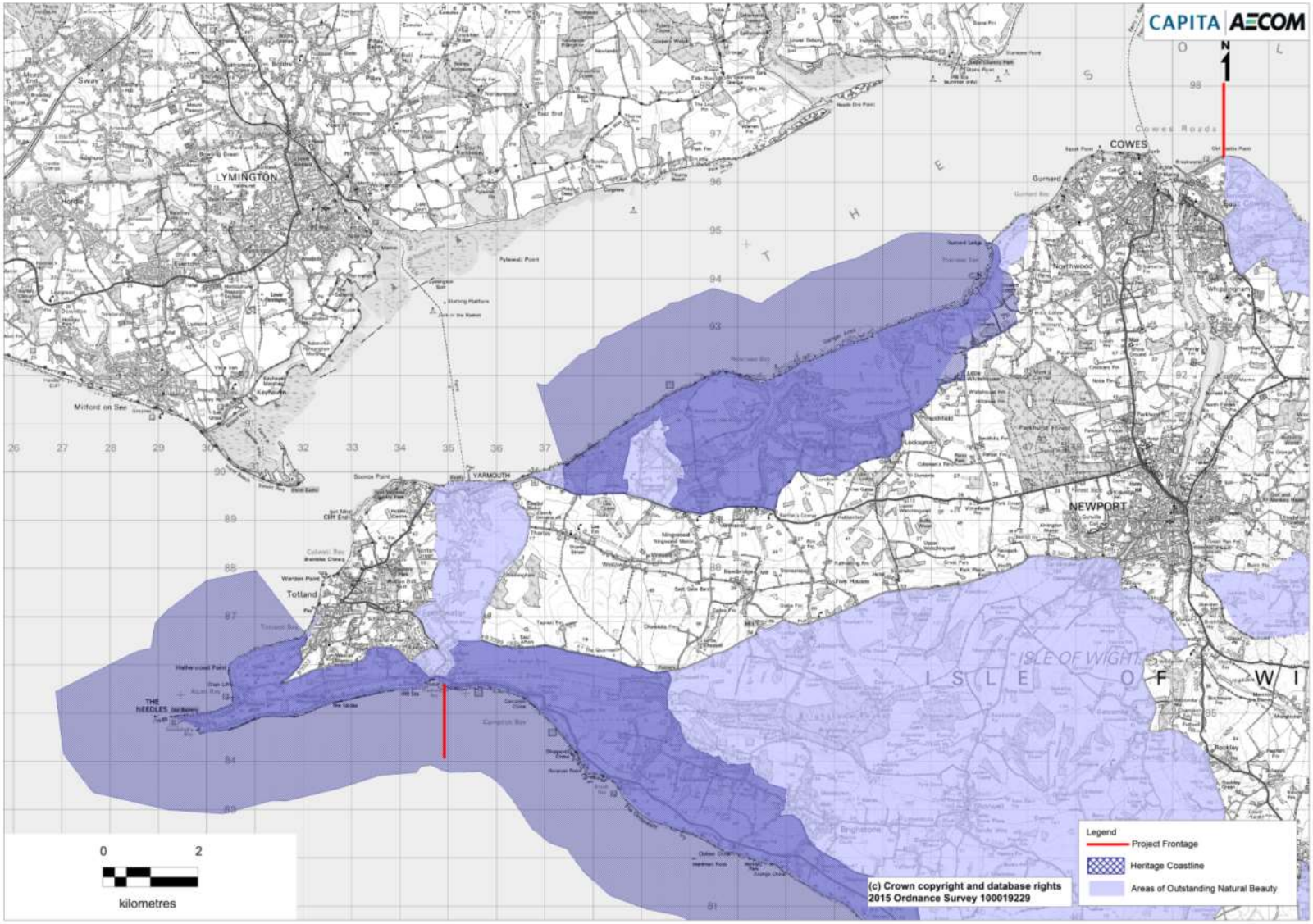


Figure 11-1: West Wight Landscape Feature

12. Health

12.1 Policy Context

The interaction of humans with the natural environment is proven to be beneficial to health and wellbeing, as demonstrated by the delivery of cultural ecosystem services for instance. Cultural ecosystem services can be defined as a non-material benefit that contributes to the development and cultural enhancement of people[92]. The National Ecosystem Assessment[93] found that:

- Observing nature and participating in physical activity in green spaces plays an important role in influencing human health and well-being;
- Ecosystems provide three generic benefits: direct positive effects on both mental and physical health, indirect positive effects which facilitate nature-based activity and social engagement and a reduction in threats of pollution and disease vectors;
- Local greenspaces or nearby natural habitats are vital for all;
- Access to nature can encourage participation in physical activity;
- Green exercise can result in improvements to self-esteem and mood;
- Nature-dominated drives increase recovery from stress;
- Experiencing nature can have a significant positive impact upon heart rate and blood pressure;
- Humans depend on exposure to the sun for the synthesis of adequate amount of Vitamin D;
- Green settings offer opportunities for the building of social capital, which, in turn, benefits health; and,
- Ecosystems provide wild foods which can have a direct effect on health.

These findings are reinforced by the NPPF. One of the twelve key principles of the NPPF relates to the protection and enhancement of human health and wellbeing and states that planning should: 'take account of and support local strategies to improve health, social and cultural wellbeing for all, and deliver sufficient community and cultural facilities and services to meet local needs'.

The UK Government Sustainable Development Strategy (2005)[94] aims to enable people to satisfy their basic needs and to enjoy a better quality of life without compromising the quality of life of future generations.

Locally the Isle of Wight Joint Strategic Needs Assessment[95] provides a comprehensive overview of the population's health and wellbeing and enables the Isle of Wight's health and wellbeing board to respond to the needs and priorities identified within the report to enhance public health. This assessment is supported by the Isle of Wight Mental Health Strategy[96]; One objective of the Strategy is a Healthy *and Supportive Island* which has the following priorities:

- Reduce levels of obesity in all age groups;

92 http://www.nwf.org/Wildlife/Wildlife-Conservation/Ecosystem-Services.aspx

93 UK National Ecosystem, Assessment http://uknea.unep-wcmc.org/

94 https://www.gov.uk/government/publications/securing-the-future-delivering-uk-sustainable-development-strategy

95 Joint Strategic Needs Assessment. http://www.iwight.com/documentlibrary/view/joint-strategic-needs-assessment-jsna-1

96 Isle of Wight Mental Health Strategy. http://www.iow.nhs.uk/Downloads/Consultation%20Engagement/Mental%20Health%20Strategy%20for%20consultation.pdf?bcsi_scan_E956BCBE8ADBC89F=mh/jYKmJayEPh4kAQyerU1jIpeuKAAAAzrfXwg==&bcsi_scan_filename=Mental%20Health%20Strategy%20for%20consultation.pdf

- Improve health, emotional wellbeing and life expectancy across the island; support vulnerable communities and life expectancy across the island; support vulnerable people to live independent lives; and,
- Ensure people of all ages have places to live and things to do in their local area.

Finally the core strategy contains a number of overarching objectives which relate to the protection and enhancement of public health and wellbeing and these include:

- To support sustainable and thriving communities that enable people to enjoy a quality of life, without compromising the quality of the environment;
- To ensure that housing is provided to meet the needs of island residents; and,
- To promote and enhance community leisure and recreational facilities.

12.2 Baseline Review

The Isle of Wight's population is growing at approximately 1% per year and currently stands at 140,000. As well as population growth, the Isle of Wight is also facing population ageing with approximately 24.1% of the population aged 65 years and over. This is compared with the national average of 16.6% of England's population being aged 65 and over.

Generally the island has better health and wellbeing indicators than the national average and poorer indicators than the south-east of England. Deprivation levels are varied within the study area. Areas such as Freshwater Bay are amongst the 21-40% least deprived areas of England whilst East Cowes is amongst the 21-40% most deprived areas. As a result of health inequalities, a 10 year life-expectancy 'gap' is apparent between wards with the best and worst health and wellbeing indicators. Life expectancy is steadily improving and currently stands at 79.1 years for men and 83.2 years for a woman which is in line with the national average[97].

Throughout the Isle of Wight, educational attainment is lower than the national average. Similarly, in 2010 the island's employment rate was 63.3% lower than the English average.

Childhood immunisation rates are significantly lower than the recommended cover rates and obesity amongst children is high with 65% of the island's adult population being classified as obese. Mental health of young people is also a concern with an estimated 44% of young people perceiving to not have 'good emotional health'. In general the mental health of the population of the Isle of Wight is worse than the national average.

12.3 Likely Future Conditions

In the near future it is unlikely that the health and wellbeing of the Isle of Wight population will change drastically (either beneficially or adversely). However in the longer term it is hoped that health statistics will further improve as a result of the requirements and policies of frameworks such as the Joint Strategic Needs Assessment.

The Isle of Wight healthcare providers should be aware of the challenges faced to health and wellbeing as a result of climate change, particularly in relation to flooding incidents which may increase in both magnitude and frequency in the future as a result of a changing climate.

97 http://www.iwight.com/documentlibrary/view/joint-strategic-needs-assessment-jsna-1

12.4 Key Environmental Issues

The key environmental issues for health and wellbeing for the Isle of Wight population include:

- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment;
- Generally, health and wellbeing on the Isle of Wight is less favourable than the national average;
- Additionally there are health inequalities amongst subsets of the population;
- Local policies and plan aim to improve the health and wellbeing of Isle of Wight residents;
- Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding;
- Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety;
- Flooding can limit access to healthcare; and,
- Flood alleviation measures derived from the implementation of the coastal Strategy have the potential to protect human health by reducing flood risk.

12.5 Appraisal Findings

12.5.1 Strategy Management Zone 1 (W1) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

Likely Minor Effects

Whilst the preferred option for this SMZ is 'Do Nothing', health and safety obligations relating to the eroding coastline will be accounted for, mainly through private maintenance.

12.5.2 Strategy Management Zone 2 (W2-W7) (SMP - PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

Likely Minor Effects

Minor beneficial impacts are anticipated in regards to human health across this SMZ as a result of assured health and safety compliance and enhanced access within the first epoch. Within the second and third epoch, human health will be further protected by the implementation of a CCMA which will ensure that human health is protected and enhanced despite increasing risks.

12.5.3 Strategy Management Zone 3a – (W8, W9 and W15-W17) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

Likely Minor Effects

Minor beneficial impacts are anticipated in regards to human health across this SMZ as a result of assured health and safety compliance and enhanced access across all three epochs.

12.5.4 Strategy Management Zone 3b – (W10, 13, W14) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

12.5.5 Strategy Management Zone 3c – (W11 and W12) (SMP – PDZ6)

Likely Significant Effects

Significant benefits expected to human health by implementing new defences and raising the flood SoP at Freshwater Village in the future.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

12.5.6 Strategy Management Zone 4 – (W18-W20) (SMP – PDZ7)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

Likely Minor Effects

Under a ‘Do Nothing’ scenario, there are a number of potential risks to human health which arise across this SMZ including an increased risk of landslides and risks to properties near Cranmore, Thorness Bay holiday park, Thorness itself and Gurnard Luck, all of which have implications for human health.

Upon development of the strategy it was identified that due to a lack of quantifiable 'benefits' and as a result constrained resources, it is not viable to undertake works in this area. However, this SEA proposes mitigation measures within Section 12.6.

12.5.7 Strategy Management Zone 5a – (W21, W22) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

Likely Minor Effects

A number of measures have been suggested as a result of the Strategy development which will have beneficial impacts upon human health in relation to this SMZ. For example, a number of health and safety measures will be implemented alongside the installation of PLP measures. In the long-term the development and implementation of a CCMA will ensure sustainable development along the coastline which facilitates the protection of human health and wellbeing.

12.5.8 Strategy Management Zone 5b – (W23) (SMP – PDZ1)

Likely Significant Effects

Significant benefits are anticipated in relation to human health across this SMZ. This is as a result of the significant risks initially posed to this area and subsequently the measures put in place to control these risks. For instance, without appropriate measures, the erosion risk and potential for seawall failure at Esplanade Road could significantly impact the public highway, residential properties, footpath access and access to public open space in this area. Erosion of this frontage may also assist in destabilising the coastal slopes at risk of landslide reactivation.

However, the proposed measures of maintaining and subsequently refurbishing defences ensure that these risks are alleviated and subsequently reduce risks on human health.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

12.5.9 Strategy Management Zone 6a – (W24, W25, W31) (SMP – PDZ1)

Likely Significant Effects

Significant benefits are anticipated in relation to human health during the second and third epochs as a result of an improved SoP of defences.

Likely Minor Effects

Minor benefits are anticipated in relation to human health across this SMZ during epoch one whereby a 1.33% AEP SoP will be sustained through the use of demountables and PLP for the areas at greatest risk.

12.5.10 Strategy Management Zone 6b – (W26-W28, W30, W32) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

12.5.11 Strategy Management Zone 6c – (W29) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to human health as a result of the implementation of the preferred option.

12.6 Proposed Mitigation

It is expected that the preferred option of 'Do Nothing' in SMZ4 will have minor adverse consequences upon the environmental receptor of human health. This is as a result of the potential flood and erosion risk to several properties near Cranmore, Thorness Bay holiday park, Thorness and, adjacently, in Gurnard Luck, in addition to the potential increase risk of landslides.

Whilst an adverse impact is expected, it is considered to be a minor one as a result of the small number of individuals affected. Despite this, mitigation measures should be implemented where possible to reduce the risks posed to local communities.

In the longer term, additional numbers of properties will be at risk in SMZ 2, therefore a CCMA will be implemented in this location (as well as in SMZ 5a) to address the increasing risks.

In the instance of flooding, private PLP measures should be installed where feasible. These are relatively low cost measures which can offer a significant level of protection to homeowners. The National Flood Forum[98] provides further information as to PLP measures available and recommended suppliers and installers through their 'Blue Pages'.

Despite the relative low cost of PLP measures, householders may struggle to fund such schemes without grant funding. Subsequently this Strategy promotes the Isle of Wight Council and EA taking forward PLP schemes involving grant funding where feasible. Additionally, Defra's Repair and Renew Grant recently provided grant funding of up to £5,000 to homes and businesses to establish flood resistance and/or resilience to reduce the risk of future flooding for properties which were flooded between 1st December 2013 and 31st March 2014.

98 The National Flood Forum (2014) What is PLP? http://www.nationalfloodforum.org.uk/what-is-plp/

In regards to the risks associated with landslides, this Strategy recommends measures to minimise the risk of landslide reactivation to properties and residents. The scale of measures varies, and is dependent on the scale of the landslide hazard and risk, and the achievability of suitable risk reduction. Where large scale measures are not economically viable, an adaption approach is therefore proposed to be taken forward to assist the communities affected.

12.7 Proposed Monitoring

In order to facilitate a sustainable approach to future management, a monitoring framework should be put in place to ensure that human health is both protected and enhanced within this SMZ:

- Number of flood incidents reported
- Number of properties / businesses at risk of flooding
- Number of flood related injuries/fatalities
- Number of measures located in areas with an above average number of elderly people or level of deprivation

13. Material Assets

Although Material Assets are listed as a topic to be addressed in SEA, there is no definition as to what they might encompass. A common interpretation of Material Assets includes housing and infrastructure relating to areas such as energy, water and transport networks, as well as social infrastructure such as schools, hospitals and other public buildings.

Similarly, material assets are taken to be those whose loss would have the potential to have an effect (which is often economic), on an area such as the built environment and/or infrastructure.

13.1 Policy Context

The NPPF contains several references and sections which relate to the provision of both social and physical infrastructure such as the Core Planning Principles. The framework recognises the importance of high quality communications infrastructure and technology, especially in delivering sustainable economic growth and enhancing the provision of local community facilities and services. In addition, the NPPF advocates that new development should take account of environmental issues by accommodating natural hazards and the impact of climate change whilst avoiding areas at risk of flooding and/or sea-level rise. It also seeks to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development through the sequential and exception test.

The Isle of Wight's Core Strategy contains a number of policies related to material assets such as:

DM1: Sustainable Build Criteria for New Development;
DM2: Design Quality for New Development;
DM3: Balanced Mix of Housing;
DM4: Locally Affordable Housing;
DM7: Social and Community Infrastructure;
DM19: Waste; and,
DM21: Utility Infrastructure Requirements.

13.2 Policy Objectives

Examples of policy objectives relating to the Isle of Wight's Material Assets encompassed with the Core Strategy include:

- DM3: Contribute to meeting the identified housing need for the local area;
- DM7: Consider the needs and requirements for all people in the community it will serve;
- DM11: Deliver economic led regeneration;
- DM17: Contribute to meeting the aims and objectives of the Island Transport Plan;
- DM19: Support the delivery of the Council's Municipal Waste Management Strategy;
- DM21: The Council will support proposals for improvements in the provision of the Island's utility infrastructure; and,
- Proposals for new developments will need to demonstrate that there is capacity within the relevant utility infrastructure provision to support the proposed development.

13.3 Baseline Review

Built Environment of the Study Site

PDZ 6: West Wight (SMZ 1,2 and 3)

This area contains three main towns located in the west of the Island: Freshwater, Totland and Yarmouth, as well as smaller communities such as Colwell and Norton. These towns are linked by a network of local A and B roads which cross the Western Yar estuary and river in several locations.

The Western Yar valley (which runs south to north through West Wight) is crossed by roads and tracks in several locations and there is potential to cut off these links during future flood events and their potential loss through coastal erosion. At Freshwater Bay the A3055 coastal road links through the main town of Freshwater to the north-west. The principal road from Newport to the West Wight runs along a vulnerable section of coastline and crosses the Western Yar estuary at Yarmouth Harbour via a swing bridge. Wightlink offer a ferry route from Yarmouth to Lymington which is the shortest and faster car ferry route to the Isle of Wight.

A coastal footpath runs around the length of this frontage and there is a popular cycle path running along the east bank of the Western Yar Estuary. The majority of beaches are accessible via small local roads and footpaths and at Alum Bay via steep steps or chairlift. A vehicle and passenger ferry from Yarmouth to Lymington provides a key transport link for the community, industry and tourism. Several small piers and boat moorings are located around the coastline and RNLI lifeboats operate from Freshwater Bay and Yarmouth Harbour.

PDZ6 (SMZ 1,2 and 3)

PDZ 7: North-west Coastline (SMZ 4)

The coastal stretch from Bouldnor to Gurnard Luck is undeveloped with scattered properties and farms at Cranmore and Hamstead and a holiday park at Thorness Bay. The coast is accessible mainly through public footpaths and the occasional small local road or track.

The A3055 runs through the village of Shalfleet at the inland limit of the estuary and is mainly residential, with small local business, public house, and car parking. The hamlet of Newtown lies on a peninsula between the branches of the estuary. The small village of Porchfield and the local roads to access it are at the eastern margin of the estuary basin.

Much of the coastal land surrounding Newtown Estuary is owned by the National Trust. The eastern shore of Newtown estuary (Clamerkin Lake) is a firing range operated by South East Reserves Forces and Cadet Association consisting of 810 acres. The northern border of the area is 1.5 miles of coastline and is used for beach landing exercises.

The Coastal Path runs significantly inland around the estuary and the firing range, rejoining the frontage at Thorness Bay.

A small sewage treatment works is apparent within this area.

PDZ7 (SMZ 4)

PDZ 1: Cowes and the Medina Estuary (SMZ 5 and 6)

The coastal stretch of Gurnard Luck to East Cowes comprises the towns of Gurnard, Cowes and East Cowes which form significant waterside communities at risk from both coastal flooding and erosion. The towns of Cowes and East Cowes have mostly promenades and residential frontages facing the Solent, with commercial and industrial frontages within the estuary mouth, including widespread harbourside facilities and marinas. Red Funnel operates a high speed passenger service from Cowes to Southampton and a car ferry service from East Cowes to

Southampton. The main transport route connecting Cowes and East Cowes is the floating bridge, which is a chain ferry, without which it is necessary to drive inland around the length of the estuary. The road network is centered around the A3020 running south along the west of the Medina valley to the Island's country town, Newport. There is a popular cycle path running along the west bank of the Medina Estuary.

Flood risk is reduced to holiday homes and properties at Gurnard Luck through the management of tidal water levels at the bridge on Marsh Road by a stone masonry bridge incorporating four flap valves. Erosion and Tidal flood risk at both Cowes and East Cowes is mitigated by an ad-hoc series of private, Isle of Wight Council and Environment Agency seawalls and quays, some of which also provide recreational access to the Solent. These defences provide only a moderate standard of protection (1 in 25 years), and overtopping occurs in places.

There are also various key cross-Solent pipelines/cables that come ashore at Gurnard.

The Medina Estuary extends 6.8km southwards from Cowes and East Cowes to its tidal limit at Newport Harbour. Along its length are a number of farms, scattered residential areas, recreational and commercial moorings and sewage works. There is a marina and residential development on the east bank at Island Harbour. Towards the town of Newport there are industrial sites along the western frontage of the estuary and a cemetery on the eastern bank. The upper estuary around Newport Harbour is surrounded by properties, waterside offices, commercial units, quayside and wharf frontages.

Commercial wharves and quays are sporadically distributed along both banks of the Medina Estuary from Cowes and East Cowes to Newport. The Island is wholly reliant on imports for hard stone construction and imports around 50% of its sand and gravel requirement. All bulk cargo transported by sea (as opposed to lorry-based) including all aggregate imports, are landed in the Medina Estuary.

A small sewage treatment works is apparent within this area.

PDZ1 (SMZ 5 and 6)

Coastal Flood Defences

The following section gives a brief overview of the flood defences present along the project frontage. For further information please refer to the West Wight Coastal Flood and Erosion Risk Management Strategy Defence Condition Assessment undertaken in December 2014.

PDZ 6: West Wight(SMZ 1,2 and 3)

The seawall at Freshwater Bay protects Freshwater and Afton Marsh. The entire western headland of the Isle of Wight is undefended, from central Totland Bay around Warden Point to southern Colwell Bay there was until recently a continuous seawall defence. Sections of this seawall show cracking and deterioration. A 120m section was breached by a major landslide in December 2012. Rock armour groynes are present between Totland Pier and Warden Point and to the north in central Colwell Bay a field of timber groynes with rock stubs have now been rendered ineffective through cliff retreat.

At Fort Albert (Cliff End) there are remains of defences and more robust rock armour revetments are present. Fort Albert itself is protected by steel sheet piling, and concrete defences extend to Round Tower Point. This section of defences is surrounded by adjacent eroding coast to the north and south.

From Fort Victoria to Norton there are ageing defences and short groynes along the shoreline. To the east there is a shingle ridge, giving way to deteriorated rockfilled gabions fronting the most vulnerable section of the adjacent local coastal access road. A more robust seawall fronts Norton Grange.

To the west of Yarmouth harbour, Norton Spit is a natural feature which has been stabilised by timber breastwork and extended by a rock armour breakwater. The Western Yar Estuary has a limited number of scattered short lengths of walls and embankments but is largely undefended. To the east of the harbour, around the western edges of the town of Yarmouth (from the Castle to Thorley Brook) a series of seawalls and revetments have residual lives of 15-25 years, but are already overtopped. Some short sections of steel sheet piling are expected to have longer lifetimes. Residual life refers to the time to when a defence is no longer able to achieve minimum acceptable performance criteria in terms of serviceability or structural strength.

From Yarmouth Castle to the east defences and hard structures fronting the coast are piecemeal but relatively continuous until Port la Salle. There are localised land stability problems in this area that may be re-activated by deterioration of the sea-wall. From Yarmouth Common to Bouldnor the steel piled toe of the seawall is poor condition and suffering from corrosion. The series of seawalls from Yarmouth to Bouldnor have residual lives (without any further maintenance) of 15-25 years. Some sections of recent wall and steel sheet piles are in better condition and subsequently have longer lifespans. It is important to note that the central section (where the main road is supported on an embankment adjacent to the seawall) is in poor condition. Along the Port la Salle frontage, development is protected by combination of steel sheet-piling, rock armour, concrete wall and gabions

PDZ 7: North-west Coastline (SMZ 4)

This frontage is undefended with only very minor defences or access structures in limited locations. There are no defences present along the western frontage from Bouldnor to Newtown Estuary, with the exception of a short 30m concrete revetment located at Hamstead which has a residual life of 10-15 years. Within Newtown Estuary the branching shoreline is undeveloped with the exception of short lengths of masonry walls and embankments at Shalfleet Quay and Newtown Quay, which have a residual life of approximately 15-25 years. No defences are present along the eastern frontage from Newtown Estuary to Gurnard Luck. There are two short sections of gabions immediately approaching Gurnard Luck which have a residual life 1-10 years.

PDZ 1: Cowes and the Medina Estuary (SMZ 5 and 6)

At low-lying Gurnard Luck, coastal defences are in place except for an undefended coastal slope to the west between Gurnard Luck and Gurnard Bay. The defences at Gurnard Luck are generally poor and failed in the past causing active erosion locally (although this has recently been privately repaired). The freshwater outlet of Gurnard Luck incorporates tidal flap valves protecting Gurnard Marshes, but flooding from several sources occurs in extreme events. Defences extend from Gurnard Bay eastwards to Cowes and the mouth of the Medina Estuary which is comprised of an ad-hoc series of both private and public seawalls offering a moderate standard of protection (1 in 25). These defences also prevent landslide reactivation around the headland. During periods of high spring tide/swell, areas of seawall backed by wide roads and parades are locally overtopped causing flooding. The coastline from Cowes floating bridge to Medina Wharf is defended and fronted by sailing and industrial marine facilities and commercial wharf.

Within the Medina Estuary, the central, western side of the Medina Estuary is largely undefended with the exception of West Medina Mills Wharf. At Newport, at the southern end of the estuary, harbour walls surround the tidal harbour. The central east side of the Medina Estuary is typically undefended, with the exception of Island Harbour marina that incorporates a tidal lock, and limited defences near the Folly Inn.

Moving into East Cowes, the north east side of the Medina Estuary from Kingston Wharf to the north consists of private, leisure, and industrial related defences and infrastructure.

The eastern shore of the estuary mouth, from the floating bridge to the Shrape Breakwater consists of private defended frontages and slipways, then public defences, with an area of overtopped seawall.

Outside the Shrape Breakwater, seawall defences extend eastwards to Old Castle Point protecting the coastal slope from erosion, although it is affected by slope instability.

In May 2014, construction of a new offshore breakwater began in Cowes. The detached breakwater will span 350m and will provide additional shelter for harbour users, businesses, and homes.

13.4 Likely Future Conditions

Development pressures and climate change along with associated extreme weather events such as flooding are likely to increase the stresses placed on West Wight's material assets, many of which (such as coastal defences) are already shown to be deteriorating.

Ultimately, the likely future conditions of such assets will be determined by the chosen method of coastal protection measure and policies (i.e. hold the line, advance the line etc.). The purpose of the Strategy is to outline the measures and actions which shall be undertaken to protect and enhance the coastline and its assets in both the short, medium and long term, inclusive of climate change and associated impacts such as sea-level rise and coastal erosion. As a result, the indirect protection and enhancement of West Wight's material assets can be ensured. Alternatively, a failure to implement the Strategy and its associated measures may pose indirect risks to the Island's assets.

13.5 Key Environmental Issues

The key environmental issues highlighted for material assets throughout West Wight are identified as follows:

- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management;
- Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement;
- West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055.
- Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes;
- Alongside residential areas, West Wight also comprises industrial and commercial land uses alongside rural areas and agricultural land;
- Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions;
- However a number of these defences are shown to be in poor condition and have been subject to failure in recent years;
- As a result of overtopping and breach, these coastal defences will require future management,

- The purpose of the Strategy is to outline the measures and actions which shall be undertaken to protect and enhance the coastline and its assets in both the short, medium and long term, inclusive of climate change and associated impacts such as sea-level rise and coastal erosion; and,
- As a result the Strategy is likely to indirectly protect West Wight's material assets through a reduction in flood risk.

13.6 Appraisal Findings

13.6.1 Strategy Management Zone 1 (W1) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

13.6.2 Strategy Management Zone 2 (W2-W7) (SMP - PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

Likely Minor Effects

In the first epoch it is unlikely that there will be any effects upon material assets. However, in the second and third epoch, the delivery and implementation of the CCMA is likely to result in minor beneficial impacts upon material assets as the plan prevents inappropriate development within high risk areas of the coastline.

13.6.3 Strategy Management Zone 3a – (W8, W9 and W15-W17) (SMP – PDZ6)

Likely Significant Effects

Likely significant effects are anticipated within epoch three as a result of raising/implementing new defences (bunds and floodwalls) to manage long-term flooding and erosion risk; this will majorly benefit the material assets within this area.

Likely Minor Effects

Minor beneficial impacts are anticipated in relation to material assets in the first and second epoch. This is as a result of the maintenance of existing defences and the breakwater along with the implementation of temporary flood barriers and a setback defence which will protect a significant number of material assets.

13.6.4 Strategy Management Zone 3b – (W10, 13, W14) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

13.6.5 Strategy Management Zone 3c – (W11 and W12) (SMP – PDZ6)

Likely Significant Effects

Likely significant effects are anticipated in the future as a result of new defences at Freshwater Village to manage long term flood and erosion risk; majorly benefiting the material assets in the area. Refurbishment of existing defences at Freshwater Bay will help sustain transport links behind, protecting against erosion.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

13.6.6 Strategy Management Zone 4 – (W18-W20) (SMP – PDZ7)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

Likely Minor Effects

Material assets are likely to likely to be affected by minor adverse impacts across this SMZ; this is as a result of both the flood risk and risks posed to the built environment as a result of increased landslide risk.

13.6.7 Strategy Management Zone 5a – (W21, W22) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

Likely Minor Effects

Minor, beneficial impacts are expected across this SMZ in relation to material assets as the installation of PLP measures will protect material assets internally whereas the development and implementation of a CCMA is likely to offer protection to material assets in the future.

13.6.8 Strategy Management Zone 5b – (W23) (SMP – PDZ1)

Likely Significant Effects

A number of significant benefits are anticipated in relation to material assets as a result of the implementation of the preferred option across this SMZ. This is due to the fact that large numbers of properties will be protected from erosion and the risk of landslide reactivation minimised (flood risk will remain to the road and a small number of properties).

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

13.6.9 Strategy Management Zone 6a – (W24, W25, W31) (SMP – PDZ1)

Likely Significant Effects

In the second and third epoch, significant benefits are anticipated for material assets in SMZ 6a. This is due to the improved SoP offered by flood defences which will significantly reduce flood risk posed to material assets and the built environment.

Likely Minor Effects

In the first epoch, minor beneficial impacts are anticipated across this SMZ in relation to material assets. This is as a result of sustaining a 1.33% AEP SoP to the areas at greatest risk through the use of demountables and PLP.

13.6.10 Strategy Management Zone 6b – (W26-W28, W30, W32) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

Likely Minor Effects

There are likely to be minor adverse implications for material assets across this SMZ as result of the preferred option as isolated properties are at risk of erosion or flooding. Mitigation will subsequently be required and is discussed in Section 13.7.

13.6.11 Strategy Management Zone 6c – (W29) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to material assets as a result of the implementation of the preferred option

13.7 Proposed Mitigation

As previously identified, the SEA has highlighted potential risks in SMZ4 relating to flood risks upon material assets and how subsequently this is likely to influence human health. As adverse impacts upon human health are derived from the risks posed to material assets, the proposed mitigation measures are the same. Impacts upon material assets are also expected in SMZ 6b; however, human health impacts are not anticipated in response to these risks.

In the instance of flooding, private PLP measures should be installed where feasible. Relatively these are low cost measures which can offer a significant level of protection to homeowners. The National Flood Forum[99] provides further information as to PLP measures available and recommended suppliers and installers through their 'Blue Pages'.

Despite the relative low cost of PLP measures, householders may struggle to fund such schemes without grant funding. Subsequently this Strategy promotes the Isle of Wight Council and EA taking forward PLP schemes involving grant funding where feasible. Additionally, Defra's Repair and Renew Grant recently provided grant funding of up to £5,000 to homes and businesses to establish flood resistance and/or resilience to reduce the risk of future flooding for properties which were flooded between 1st December 2013 and 31st March 2014.

In regards to the risks associated with landslides, this Strategy recommends measures to minimise the risk of landslide reactivation to properties and residents. The scale of measures varies, and is dependent on the scale of the landslide hazard and risk, and the achievability of suitable risk reduction. Where large scale measures are not economically viable, an adaption approach is therefore proposed to be taken forward to assist the communities affected.

13.8 Proposed Monitoring

In order to ensure the sustainable management of West Wight's built environment, it is proposed that a monitoring framework is implemented with the following indicators:

- Number of residential and non-residential properties at risk of flooding and/or erosion from local sources
- Number/severity/duration of incidents leading to unplanned disruption or damage to essential infrastructure and service provision
- Number of SuDS schemes adopted into existing and future developments
- Number of new developments permitted in areas of flood risk

99 The National Flood Forum (2014) What is PLP? http://www.nationalfloodforum.org.uk/what-is-plp/

14. Geology and Soil

Healthy soils are essential to sustainable development. Soils form part of most productive terrestrial habitats, provide a medium in which plants can grow and are, therefore, essential to biodiversity. Similarly, they play a key role in agriculture, with the fertility of the soil having a major bearing on the productivity of the land.

Soil can be considered a non-renewable resource because its formation is an extremely slow process.

14.1 Policy Context

At the international level, the Water Framework Directive (WFD) (2000/60/EC)[100] encourages the protection of soil, whilst the EU Thematic Strategy for Soil (2006)[101] promotes the protection and sustainable use of soil. In general there is little statutory protection for England's soils although they are indirectly protected by other legislation such as pollution, prevention control regimes and land use planning and contamination. Soil is mentioned in the following policy and initiatives:

- Protecting 'the best and most versatile' agricultural land;
- Minerals and Waste Planning;
- Standards of Good Agricultural and Environmental Condition;
- Environmental Stewardship; and,
- England Catchment Sensitive Farming Delivery Initiative.

Safeguarding our Soils, A Strategy for England (2009)[102] seeks to improve the quality of England's soils. The NPPF recognises that both new and existing development should not contribute to, be put at unacceptable risk from, or be adversely affected by unacceptable levels of soil pollution or land instability. In addition despoiled, degraded, derelict, contaminated and unstable land should be remediated and mitigated where appropriate.

Locally, the Isle of Wight's Core Strategy makes reference to the importance, protection and enhancement of the island's geology and soils. The Core Strategy states that *'All development will be expected to demonstrate consideration of the effects of climate change on the Island's natural environment and how the proposal may aid or hinder adaptation. Particular consideration should be given to:…The natural resource requirements of the environment such as water (both volume and quality), air quality and soil condition in order to allow natural processes and ecosystems to function as near a natural state (without human intervention) as possible'.*

The Isle of Wight Local Geodiversity Action Plan (LGAP)[103] has the overarching aim of formulating a strategy to promote the Isle of Wight through the conservation and sustainable development of its Earth Heritage and has the following objectives:

- To audit the existing Earth Heritage resource of the Isle of Wight;

100 Water Framework Directive (2000) http://ec.europa.eu/environment/water/water-framework/index_en.html

101 EU Thematic Strategy for Soil Http://ec.europa.eu/environment/soil/index.htm

102 https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england

103 Isle of Wight Local Geodiversity Action Plan (February 2010) http://www.dinosaurisle.com/documents/IWLGAP2010.pdf?bcsi_scan_E956BCBE8ADBC89F=0&bcsi_scan_filename=IWLGAP2010.pdf

- To audit existing Earth Heritage interpretation on the Isle of Wight;
- To form an action plan to help conserve the Island's Earth Heritage resource; and,
- To form an action plan to develop a sustainable way the Island's Earth Heritage Resource to the benefit of the Island community and visitor.

The Isle of Wight LGAP complements a suite of resources and initiatives such as the Isle of Wight AONB, Local Biodiversity Action Plan, Historic Environment Action Plan, Historic Landscape Assessments and the Isle of Wight's corporate objective of *'Protecting the Island's Physical Environment'.*

In order to protect the soil resources on the Isle of Wight the Isle of Wight Contaminated Land Liaison Group produced informal guidance on developing on contaminated land[104]. This guidance provides a framework for assessing the risk of land contamination for new developments. Prior to this in 2001 the Isle of Wight Council produced a Contaminated Land Inspection Strategy[105].

14.2 Environmental Policy Objectives

The European Soil Thematic Strategy (2006) has the following objectives:

- Establish common principles for the protection and sustainable use of soils;
- Prevent threats to soils, and mitigate the effects of those threats;
- Preserve soil functions within the context of sustainable use; and
- Restore degraded and contaminated soils to approved levels of functionality.

Safeguarding our Soils, A Strategy for England (2009)[106] has the following overall vision: *'By 2030, all England's soils will be managed sustainably and degradation threats tackled successfully. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.'*

Part IIA of the Environmental Protection Act (1990)[107] requires Local Authorities to identify contaminated land in their area.

The NPPF in regards to soil and geology states that planning policies should:

- Protect and enhance valued landscapes, geological conservation interests and soils;
- Prevent both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, pollution or land instability; and,
- Remediate and mitigate despoiled, degraded, derelict, contaminated and unstable land.

14.3 Baseline Review

The majority of the project frontage is located upon Paleogene geology with Cretaceous Chalk geology being present in the Freshwater area. Figure 14-1 and Figure 14-2 show bedrock geology and superficial deposits for West Wight. Key geological sites of interest on the Isle of Wight are protected through the SSSI network.

104 Development of Potentially Contaminated Land (2005) http://esinternational.com/wp-content/uploads/Hampshire-and-Isle-of-Wight-Contaminated-Land-Group.pdf

105 Contaminated Land Inspection Strategy (2001) http://old-iwight.onthewight.com/living_here/environment/environmental_health/images/Executive_Summary.pdf

106 Safeguarding our Soils (2009) https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england

107 http://www.legislation.gov.uk/ukpga/1990/43/contents

The majority of bedrock geology across the site can be characterised as the 'Solent Group' which comprises clay, silt and sand. The Solent Group extends from East Cowes to Totland where it is met by thin bands of Brackelsham Group and Barton Group sand, silts and clays, Thames Group clay, silt, sand and gravels and the Lambeth Group also comprising clay, silt, sand and gravels and further Cretaceous Chalk subgroups (grey and white).

The Isle of Wight is known to be highly geologically diverse. The LGAP identifies the following as the principal examples of the islands geodiversity:

- The Isle of Wight is recognised as the best site in Europe for dinosaur remains, large numbers of early Cretaceous dinosaurs have been found in eroding cliffs such as Neovenator salerii, Eotyrannus lengi, Hypsilophodon foxii, Iguanodon atherfieldensis, Valdosaurus canaliculatus and Yaverlandia bitholus (although these sites are outside the Strategy area);
- Alum Bay is a popular destination for distinctive coloured sand cliffs;
- The Paleogene silts, clays, mud and sands of the northern coasts contain a rich diversity of fossils and environmental information, Alum Bay is amongst a number of designated SSSIs which are designated as a result of their geology; and,
- The Quaternary gravels present on the north coast contain a number of human artefacts for the Palaeolithic period.

There are a number of areas within the study site where fossil remains may be found. For instance Gurnard is known to be classic locations for finding insect fossils which are found in the Bembridge Marls (Eocene age) and over 200 species have been found. Similarly, Newtown Estuary is often seen to be a good place to find mammalian fossils[108]. There are a number of geological SSSIs which in order to achieve favourable condition may require some erosion to maintain exposures.

14.4 Likely Future Conditions

Impacts upon geology and soils resulting from climate change are likely to be complex, since climate, geology, soils, topography, drainage and vegetation are inter-related. Climate change is likely to lead to an increase in the frequency and severity of extreme weather events (such as flooding and increased surface water runoff), which in turn may lead to increased soil erosion and degradation of land and/or protected sites. In addition, flood events may increase the incident of pollution events through the mobilisation of contaminants over a wider area.

There are also concerns about the gradual degradation of both the countryside and urban environment through changing farming practices, drainage of wetlands, increased pressure from transport and the need for new housing and other development. Future flood events may cause damage to agricultural land which could have consequences for the rural economy.

As a result of coastal erosion, local geology may be eroded resulting in a loss of geodiversity and associated heritage, much of which may yet to be identified and documented. However, the Strategy which aims to protect and enhance the coastline and its assets may prevent such losses in some instances. Where coastal erosion occurs, new exposures and habitats may be provided.

108 http://www.redfunnel.co.uk/my-isle-of-wight/features/guide-to-our-best-fossil-huntng-locations/

14.5 Key Environmental Issues

The key environmental issues identified for West Wight in regards to geology and soil includes the following:

- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land;
- The Isle of Wight is highly diverse geologically;
- The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand;
- Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology;
- There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits;
- Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding;
- Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage; and,
- The main aim of the Strategy is to protect and enhance the coastline and associated assets therefore the Strategy is likely to minimise pressures on soil and geological assets.

14.6 Appraisal Findings

14.6.1 Strategy Management Zone 1 (W1) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

14.6.2 Strategy Management Zone 2 (W2-W7) (SMP - PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

Minor, adverse impacts are anticipated across this SMZ for each epoch. This is due to the fact that under the preferred option, additional landslides may arise which could impact upon the integrity of geology and soils, although these will provide new exposures.

14.6.3 Strategy Management Zone 3a – (W8, W9 and W15-W17) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

14.6.4 Strategy Management Zone 3b – (W10, 13, W14) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

14.6.5 Strategy Management Zone 3c – (W11 and W12) (SMP – PDZ6)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

14.6.6 Strategy Management Zone 4 – (W18-W20) (SMP – PDZ7)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

Minor adverse impacts are anticipated for geology and soil across this SMZ during each of the three epochs, this is due to the erosion of the cliff toe and cliff foot debris triggering mudslides, transitional slides and infrequent deep-seated rotational slides, although these will provide new exposures.

14.6.7 Strategy Management Zone 5a – (W21, W22) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

14.6.8 Strategy Management Zone 5b – (W23) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

Minor beneficial impacts in regards to geology and soil are anticipated across this SMZ for all three epochs. This is due to the fact that effective seawall maintenance will significantly reduce the risk of landslide reactivation by continuing to prevent coastal slope toe erosion and undermining.

14.6.9 Strategy Management Zone 6a – (W24, W25, W31) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

14.6.10 Strategy Management Zone 6b – (W26-W28, W30, W32) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

14.6.11 Strategy Management Zone 6c – (W29) (SMP – PDZ1)

Likely Significant Effects

There are no significant effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

Likely Minor Effects

There are no minor effects (either adverse or beneficial) expected in regards to geology and soils as a result of the implementation of the preferred option.

14.7 Proposed Mitigation

Whilst significant adverse impacts are not anticipated for either SMZ2 or SMZ4, minor adverse impacts are expected to arise. This is due to the fact that under the preferred scenarios for these areas, there may be additional landslides which may impact upon the integrity of geology and soils, although they will provide new exposures.

In order to mitigate these impacts it is suggested that further, more-detailed assessments are undertaken to determine the risks posed to geology and soils within this area and how these impacts can be reduced and/or eliminated in the future. It is possible that such measures would come at substantial economic costs. If this is the case a cost-benefit assessment would need to be undertaken.

14.8 Proposed Monitoring

In order to facilitate the sustainable future management of geology and soils across West Wight in the future, a monitoring framework with the following indicators is proposed:

- Area of agricultural land lost due to the need for flood defence
- Area of county land falling under Environmental Stewardship agreements
- Sedimentation rates from IDBs
- Number of recorded pollution incidents
- Number of recorded landslides;
- Number of incidents of debris falls etc.

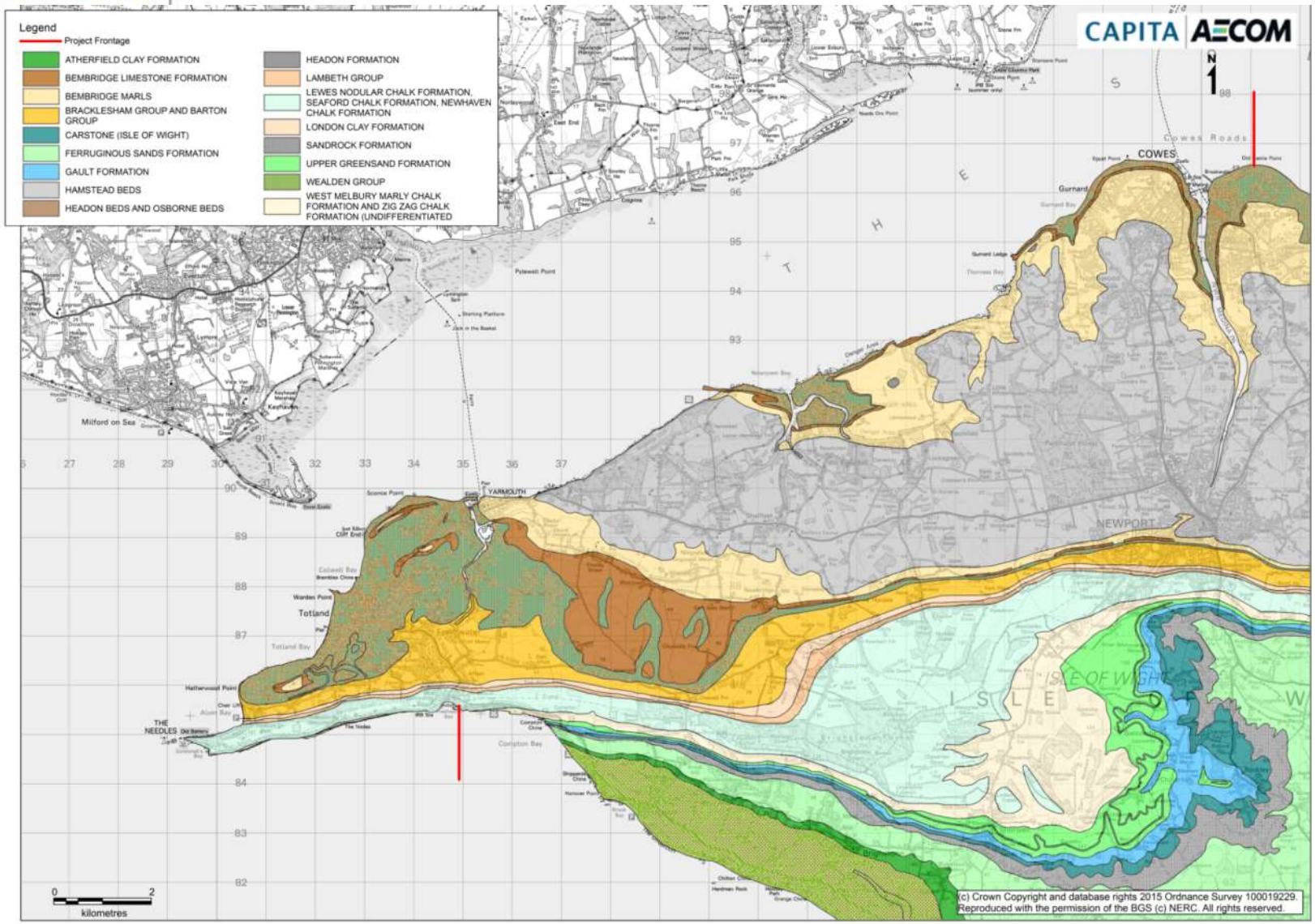


Figure 14-1: West Wight Bedrock Geology

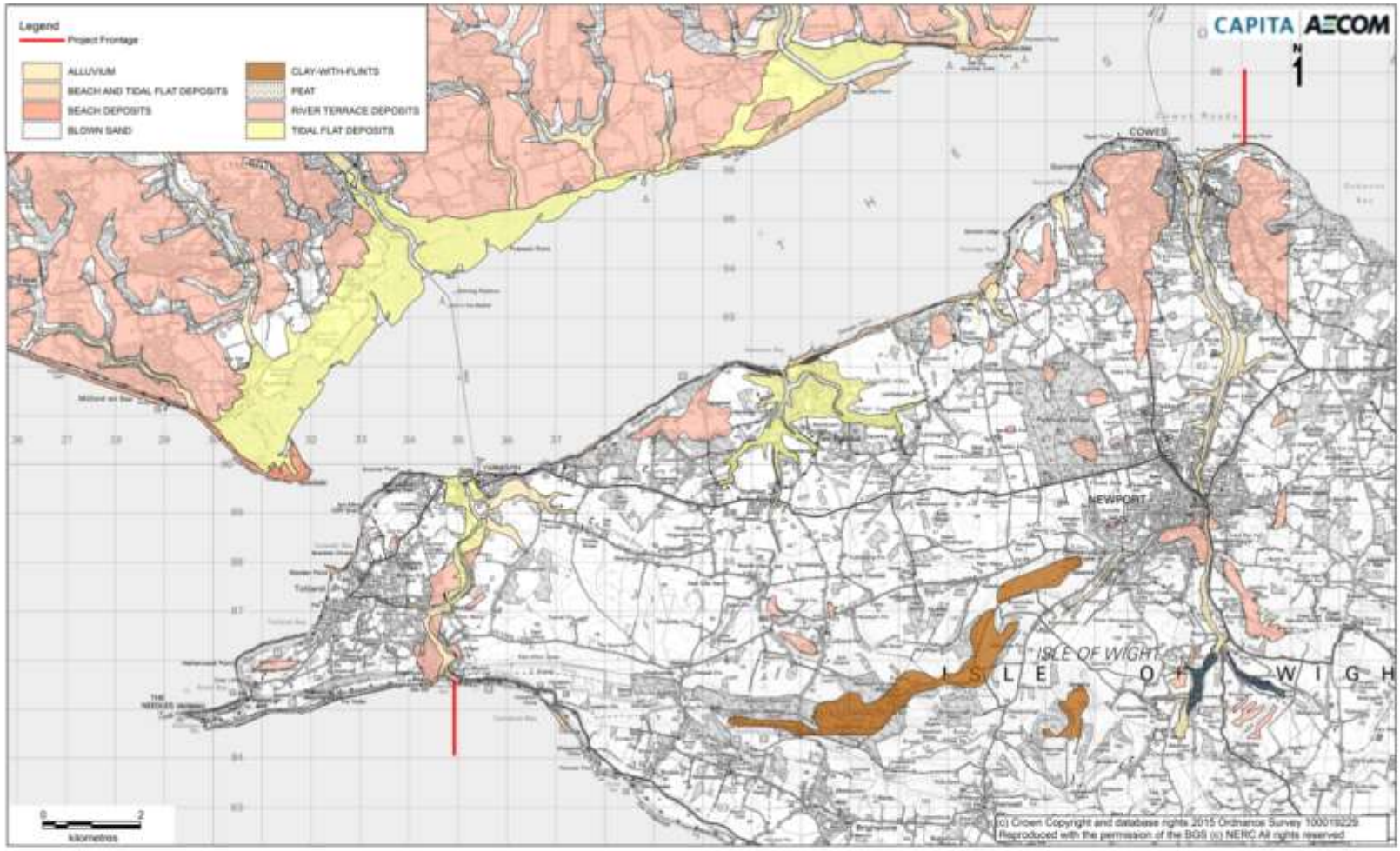


Figure 14-2: Superficial Deposits

15. Water

15.1 Policy Context

At the European level, the WFD promotes a coordinated approach to water management at the river basin scale. The WFD combines water quantity and quality issues together and takes an integrated approach to the management of all freshwater bodies, groundwater, transitional (estuarine) and coastal waters at the river basin level. 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 river basins must achieve 'good ecological status' by 2015 unless there are grounds for derogation. It also requires that Environmental Objectives be set for all waterbodies within the River Basin Management Plans (RBMPs). The South East River Basin Management Plan covers the study area of the West Wight. Ecological Status is expressed in terms of five status classes (high, good, moderate, poor or bad) which are defined using biological, physico-chemical and hydromorphological criteria. The biological assessment criteria uses numeric measures of communities of plants and animals (e.g. fish, rooted plants). The physico-chemical assessment uses elements such as temperature and nutrient levels, which support the biological communities. The hydromorphological assessment uses water flow, sediment composition and movement, continuity (in rivers) and the structure of physical habitat. The overall ecological status of a waterbody is determined by whichever of these criteria is assessed to be the poorest. To achieve the overall aim of good surface water status, the WFD requires that surface waters be of at least Good ecological status and Good chemical status.

The WFD recognises that some waterbodies have been physically altered, for example for navigation or flood defence, and allows for these water bodies to be designated as Heavily Modified Water Bodies (HMWB) or Artificial Water Bodies (AWB) and need to achieve good ecological potential rather than ecological status. Ecological potential means that the waterbody is managed to achieve the biology that can be achieved given its modified condition. HMWBs are classified by:

- Identifying the impacts of physical modification affecting the water body;
- Identifying possible mitigation measures necessary to ensure the hydromorphological characteristics of a water body are consistent with Good or maximum ecological potential; and,
- Assessing whether all of those measures have been taken.

There is also a duty to enhance and restore water bodies where possible and by implication there is a need to ensure that actions do not prevent water bodies from reaching a good status and 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. To ensure the requirements of the WFD are met for the West Wight coastal Strategy, an assessment of the proposed policy options against WFD requirements will be carried out later in the development of the Strategy.

At the national level, the Water Act (2003)[109] encourages more efficient use of water resources and facilitates streamlined arrangements for flood defence, organisation and funding. *Making Space for Water* (2004)[110] advocates a holistic approach to flooding which addresses all

109 http://www.opsi.gov.uk/ACTS/acts2003/20030037.htm

110 http://www.defra.gov.uk/environ/fcd/policy/strategy/htm

sources of flooding together. Further information on national plans, policies and strategies is detailed below.

Flood and Water Management Act 2010

The Flood and Water Management Act empowers and requires the Isle of Wight Council, as a designated Lead Local Flood Authority (LLFA), to manage flood risks from local sources (surface water, groundwater and flooding from ordinary watercourses). The Flood and Water Management Act also requires LLFAs to co-operate with Risk Management Authorities in the management of flood risk.

The Flood and Water Management Act reinforces the need to manage flooding holistically and in a sustainable manner. This has grown from the key principles within Making Space for Water and was further reinforced by the Pitt Review following the summer 2007 floods. The Flood and Water Management Act implements several key recommendations of the Pitt Review, whilst also protecting water supplies to consumers and protecting community groups from excessive charges for surface water drainage.

National Planning Policy Framework (NPPF) 2012

The NPPF and supporting guidance[111], sets out the Government's planning policies for England and how these are expected to be applied. Section 10 of the NPPF sets out the approach for meeting the challenge of climate change, flooding and coastal change. It also highlights the role that Local Planning Authorities (LPAs) have to ensure that inappropriate development in areas at risk of flooding is avoided by directing development away from areas at highest risk. Where development is necessary, the LPA should ensure that it is safe without increasing flood risk elsewhere.

National Flood and Coastal Erosion Risk Management Strategy for England (2011)

The Flood and Water Management Act states that the Environment Agency must '*develop, maintain, apply and monitor a strategy for flood and coastal erosion risk management in England*'. In response to this, the Environment Agency has developed their National Strategy jointly with Defra to ensure that it reflects government policy.

The National Flood and Coastal Erosion Risk Management Strategy was published in 2011 and sets out strategic aims and objectives for managing flood and coastal erosion risks and the measures proposed to achieve them.

Regional and Local Policy relating to flood risk is outlined below:

South East River Basin District Flood Risk Management Plan (FRMP) Scoping Report (2014)[112]

This scoping report outlines the approach which will be taken when producing the draft South East River Basin District FRMP. For the Isle of Wight this relates specifically to flooding from main rivers, the sea and coastal erosion risks. In October 2014, consultation began on the draft FRMP. The first cycle of FRMPs are expected to be published in December 2015.

Isle of Wight Catchment Flood Management Plan (CFMP) (2009)

111 Communities and Local Government (2014) Planning Practice Guidance: Flood Risk and Coastal Change: http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/

112 South East River Basin District FRMP https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/326114/LIT_9965_Southeast_FRMP_Scoping_Report.pdf

The CFMP provides an overview of the flood risks posed across the Isle of Wight catchment and potential mitigation measures both now and over the next 50 to 100 years. The development of a CFMP helps to define flood risk and consequently set policies for the management of flood risk whilst promoting the integration and collaborative working of stakeholders[113].

Isle of Wight Shoreline Management Plan 2 [114] (SMP) (2011)

The Isle of Wight SMP comprises a large-scale assessment of the potential risks arising from coastal evolution and outlines a policy framework which has the overarching aim of addressing these risks. The SMP forms part of the Defra strategy for flood and coastal defence and therefore supports the Government's aims, as set out in Defra's strategy 'Making Space for Water':

- To reduce the threat of flooding and coastal erosion to people and their property; and,
- To deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles.

Isle of Wight North-East Coastal Defence Strategy Study (2005)

This study assesses the north-eastern coast of the Isle of Wight from Shrape Breakwater at East Cowes to Culver Cliff and builds upon the findings of the original SMP and provides a more detailed assessment of particular frontages in order to determine the most effective coastal defence schemes.

15.2 Environmental Protection Objectives

Urban Wastewater Treatment Directive (1991)[115]:

- The Directive aims to protect the environment from the adverse effects of wastewater discharges;
- All urban waste water must undergo secondary treatment or equivalent, in particular for all discharges from agglomerations of more than 15,000 population equivalent (i.e. with a 5-day BOD of 60g of oxygen per day) and all discharges to freshwater and estuaries from agglomerations between 2,000 and 10,000 population equivalent.

Groundwater (England and Wales) Regulations (2009)[116]:

- Seeks to prevent or limit the input of pollutants in to groundwater.

Water Framework Directive (2000):

- Aims to improve water quality and promote the sustainable use of all UK waterbodies, including coastal waters, estuaries and all inland waterbodies;

113 Isle of Wight Catchment Flood Management Plan https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/293850/Isle_of_Wight_Catchment_Flood_Management_Plan.pdf

114 Isle of Wight Shoreline Management Planhttp://www.coastalwight.gov.uk/smp/

115 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1991L0271:20081211:EN:PDF

116 http://www.legislation.gov.uk/uksi/2009/2902/pdfs/uksi_20092902_en.pdf

- It requires all UK river basins to reach 'good status' by 2015, through demanding environmental objectives, including chemical, biological and physical targets;
- Three types of UK water quality standards are being developed (a formal classification instrument should be completed in late 2007): Priority substances (and Priority Hazardous Substances); Specific Pollutants; and Physico-chemical pollutants.

Waterways for Tomorrow 2000[117]*:*

- DEFRA's aims for the inland waterways are to see an improving quality of infrastructure; a better experience for users through more co-operation between navigation authorities; and increased opportunities for all through sustainable development.

Isle of Wight Shoreline Management Plan 2 (SMP) (2011)

The main aim of the SMP is to *'determine sustainable policies for management of the shoreline management and to set a framework for the future management of erosion and flood risks along the coastline'.*

The SMP sets policies for three time periods or *'epochs'* as follows (starting in 2005):

- Present day (0-20 years);
- Medium-term (20-50 years); and,
- Long-term (50-100 years).

It must be noted that the coastal Strategy now considers the following three epochs as follows (starting in 2015):

- Epoch 1; 2015-2025 (10years);
- Epoch 2; 2025-2055 (30 years); and,
- Epoch 3; 2055-2115 (60 years).

The objectives of the SMP reflect the Government's strategy for flood risk and coastal erosion and should therefore:

- Set out the risks from flooding and erosion to people and the developed, historic and natural environment within the SMP area;
- Identify opportunities to maintain and improve the environment by managing the risks from floods and coastal erosion;
- Identify the preferred policies for managing risks from floods and erosion over the next century;
- Identify the consequences of putting the preferred policies into practice;
- Set out procedures for monitoring how effective these policies are;
- Inform others so that future land use, planning and development of the shoreline takes account of the risks and the preferred policies;
- Discourage inappropriate development in areas where the flood and erosion risks are high; and,
- Meet international and national nature conservation legislation and aim to achieve the biodiversity objectives[118].

117 http://archive.defra.gov.uk/rural/documents/countryside/waterways/waterways-for-tomorrow.pdf

118 http://www.coastalwight.gov.uk/smp/objectives.htm

15.3 Baseline Review

In England and Wales, sea levels have risen by an average of 1mm a year over the last century. As a consequence of climatic changes and continued warming of the global oceans, sea levels are expected to increase over the coming century.

The Coastal Strategy uses the following sea-level rise projections in meters:

Location	2015	2025	2055	2115
Freshwater Bay	0	0.056	0.249	0.752
Totland	0	0.056	0.249	0.752
Yarmouth	0	0.056	0.249	0.751
Gurnard	0	0.056	0.248	0.750
Cowes	0	0.056	0.248	0.750

These sea-level changes translate to the following rates per year:

Epochs	Rate of Sea Level Rise (mm/year)
2015 - 2025	5.6
2025 - 2055	6.23
2055 - 2115	8.25

Water Quality

Water Framework Directive

Please see the Water Framework Directive Assessment for further information.

Many rivers, lakes, estuaries and coastal waters are environmentally sensitive areas. High levels of nutrient discharge can therefore affect established ecosystems. The Environment Agency has changed its monitoring technique to correlate with the WFD technique which aims to assess the whole water environment so that resources and action can be directed to where it is most needed. The Environment Agency regularly monitors the quality of rivers in relation to water chemistry, biology and nutrient levels to identify potential areas for improvement.

The Isle of Wight's water environment faces a number of challenges which prevent the majority of the island's waterbodies achieving a 'good' status as required by the WFD. Table 15-1 shows that waterbodies in close proximity to the project frontage are all considered to have a moderate status or for modified waterbodies, a moderate potential.

Most streams and rivers throughout the Isle of Wight have been dredged and straightened for flood protection and as a result of urbanisation respectively. In addition, many watercourses are subject to sedimentation and diffuse pollution. Other challenges in the area include the lack of mains drainage for rural communities and consequently the risk of septic tanks discharging sewage effluent into streams and groundwater. The discharge of effluent into waterbodies is partly responsible for high levels of nutrient which limits the ecological quality of the water environment.

Table 15-1: WFD waterbody water quality assessment.					
Waterbody Name	**Hydromorphological Status**	**Current Ecological Quality**	**Current Chemical Quality**	**Predicted Ecological Quality 2015**	**Predicted**
Gurnard Luck (GB107101006240)	Not Designated A/HMWB	Moderate Status	Does Not Require Assessment	Moderate Status	Does Not Require Assessment
Little Thorness Stream (GB107101006180)	Not Designated A/HMWB	Moderate Potential	Does Not Require Assessment	Moderate Potential	Does Not Require Assessment
Great Thorness Stream (GB107101006170)	Heavily Modified	Moderate Potential	Does Not Require Assessment	Moderate Potential	Does Not Require Assessment
Thorley Brook (GB107101006060)	Heavily Modified	Moderate Potential	Does Not Require Assessment	Moderate Potential	Does Not Require Assessment
Western Yar (Headwater) (GB107101006230)	Not Designated A/HMWB	Moderate Status	Does Not Require Assessment	Moderate Status	Does Not Require Assessment

In order for the island to become more self-sufficient in regards to water resources, it is essential that water efficiency and quality is improved. The South East River Basin District RBMP highlights a number of key actions which will help to achieve this aim.

A Water Framework Directive Assessment will be required at the Strategy level. This will include an assessment of all water bodies that could be affected by the implementation of the Strategy, including an assessment of their current water quality. Transitional and coastal water bodies will also be considered within this assessment. The Solent Forum run an initiative which aims to define what 'Good Potential' would look like in the Solent Area, known as the Seaview project.

Bathing Waters

There are four designated bathing waters along the project frontage including: Cowes, Gurnard, Colwell Bay and Totland Bay119. All four sites achieved the 'higher' standard meaning the bathing water meets the criteria for the stricter guideline standards of the Bathing Water Directive (76/0160/EEC)120.

Shellfish Waters

Designated shellfish waters are protected areas under the WFD which aim to protect and enhance the water quality of areas where shellfish are harvested for human consumption. There are a number of shellfish waters in the study area covering:

- Medina;
- Newtown;

119 http://environment.data.gov.uk/bwq/explorer/index.html#

120 http://environment.data.gov.uk/def/bwq-cc-2012/G

- Yarmouth;
- Cowes; and,
- Totland.

These Shellfish Waters have a number of associated monitoring points. In the study area there are a number of shellfish waters wherein Native Oysters are harvested. A review of recent monitoring and subsequent classifications has shown that poor water quality has led to the prohibited use of certain shellfish waters. For example, in 2010 at Medina Wharf >46000 *E. coli*/100g was recorded (however, samples also taken in 2010 in this area were assigned a Class A classification). More recently in 2015, areas such as Thorness Bay, Yarmouth West and Squadron were assigned a Classification of Class B (90% of samples must be ≤ 4600 E. coli/100g and all samples must be less than 46000 E. coli/100g). Class B molluscs can be sold for human consumption after purification, relaying in an approved Class A re-laying area or after an EC-approved heat treatment process[121]. There are a number of instances wherein Class A classifications have been assigned in recent years: Castle Point (Class 2014), Newtown (2013), Saltmead Ledge (2010), and Yarmouth East (2010).

Water Resources

The Isle of Wight abstraction licensing strategy[122] falls into the Solent and Downs area for Catchment Abstraction Management[123]. Of the total licensed water abstraction, 70% comprises groundwater and 30% comprises surface water. Public water supply use encompasses the largest proportion of water use (78%) but is dependent upon the importation of water from the mainland via an under-sea water pipeline which supplies approximately 25% of the island's water demand.

None of the catchment abstraction management strategy (CAMS) assessment points fall within the project frontage. The abstraction licensing strategy demonstrates that whilst a large area of the Isle of Wight has restricted and/or no water available for licensing, the majority of the project frontage has water available for licensing (i.e. there is more water than required to meet the needs of the environment). However, the majority of the project frontage is designated for nature conservation. The CAMS defines the sensitivity of estuarine ecology to changes in flow as moderate. Should new licenses be sought, assessments will have to be made and the impact upon freshwater flow into the estuarine areas will need to be considered.

Flood Risk

In June 2010 the Isle of Wight updated their 2007 Strategic Flood Risk Assessment[124] (SFRA). The SFRA highlights that West Wight has both fluvial and tidal flood risk, for instance the town of Freshwater has a history of flooding related to the Western Yar which presents a flood risk by acting as a conduit for tidal flood waters. Two flood investigation reports have been issued for the Western Yar in June 1999 and October 2000 as a result high rainfall events falling on

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

122 Isle of Wight abstraction licensing strategy https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289872/LIT_1805_45b469.pdf

123 https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process#solent-and-south-downs-map-area-15

124 Isle of Wight SFRA (2007) http://old-iwight.onthewight.com/living_here/planning/images/SFRA.pdf

saturated ground. Similarly, a flood investigation report was produced for Cowes and East Cowes in June 2014 as a result of extreme weather events and high tides earlier in the year[125].

Fluvial and tidal flooding are not the only sources of flood risk at West Wight. The Freshwater Flooding Feasibility Report (1999) highlighted that the surface water drainage network of Freshwater was under capacity. Similarly, the Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding. In general, the infiltration potential of soils is considered to be low. Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques are likely to be unsuitable and therefore new developments may exacerbate flood risks pre-mitigation[126]. Consequently, alternative flood risk mitigation measures must be sought.

PDZ6: West Wight (SMZ 1, 2 and 3)

One of the main concerns regarding flooding in this area is the loss and/or deterioration of residential communities as a result of erosion and flood impacts (specifically the tidal flood risk at Yarmouth port and town, and in the future, Freshwater, with the potential for tidal breach into the Western Yar), a risk which is exacerbated by low lying land. Tidal flooding has already affected the Yarmouth harbourside and western edge of the town and flood risk would continually increase in future epochs under a no active intervention scenario. Flood risk in the town is complex with the tidal flood risk also along the northern edge of the town, and a combination of tidal and fluvial risk from the estuary and tributaries to the south and west. Lanes between houses on the seafront provide possible access routes for flood waters to enter the town in the future.

The CFMP identifies a number of sub areas, one of which includes the Western Yar. The CFMP states the following: '*The key risk in this sub-area is from river flooding in Freshwater. The river channel of the Western Yar drains a small catchment which runs through Freshwater. The channel is restricted in places which can give rise to localised flash flooding. Nearer the coast, river flooding may be affected by high tide levels, which will get worse with the predicted future sea level rise. Only modest development is planned within the sub-area, however any new development could act as an additional source and/or receptor of flooding'.*

Just east of Yarmouth there is increasing potential during the second epoch for a breach through the foreshore and embankment enabling the creation of a small tidal inlet into Thorley Brook, which may offer nature conservation benefits. If a breach occurs, shoreline sediments could be transported by tidal currents generated at the new inlet and become flushed seaward. Loss of the A3054 road and also the coastal footpath link would result. From Yarmouth to Port la Salle maintenance of the seawalls will prevent erosion and a marine breach through to Thorley Brook, maintaining properties and infrastructure, but the defences themselves would become increasingly exposed to wave action.

PD7: North-west Coastline (SMZ 4)

The CFMP considers the Newtown River and the Chines to have '*a relatively low risk of fluvial flooding. Surface water flooding occurs in some urban areas due to the capacity of drains being exceeded. Nearer the coast, river flooding may be affected by high tide levels, which will get worse with predicted future sea level rise. Only modest urban development is planned'.*

125 Cowes and East Cowes Flood Investigation Report http://www.iwight.com/azservices/documents/2821-Cowes-and-East-Cowes-Flood-Investigation-Report-2014-v1.pdf

126 Isle of Wight SFRA (2010) http://www.iwight.com/azservices/documents/2782-SFRA%20Appendix%20E%20-%20West%20Wight.pdf

Tidal flooding in Newtown Estuary will encroach onto the medieval field system which is part of the Scheduled Monument of the remains of the medieval town of Newtown. Coastal change is also likely to lead to the progressive widespread exposure and loss of intertidal archaeology (palaeo-environmental features) and may potentially impact on local agricultural land.

At Thorness Bay there is the potential for tidal flood risk to extend up to 900m inland in two adjacent inlet zones within Thorness Bay, crossing the Porchfield to Northwood road. Retreat within low-lying Thorness Bay could form a small intertidal area controlled by the topography, similar in scale to the present King's Quay inlet on the north-east coast.

PDZ1: Cowes and Medina Estuary (SMZ 5 and 6)

Together the towns of Gurnard, Cowes and East Cowes form significant waterside communities at risk from both coastal flooding and erosion.

In the west of the area is the small community at Gurnard Luck, an area of improved residential and holiday dwellings located in the low-lying coastal zone with risks from both erosion and flooding. Flood risk is reduced to these holiday homes and properties at Gurnard Luck through the management of tidal water levels at the bridge on Marsh Road. At Gurnard Luck sections of the defences are already failing. Gurnard Luck stream flows through flapped culverts before exiting to the sea. The Luck can only drain during low tide conditions, and excess waters overflow into the Marsh area. The Marsh quickly fills during fluvial events and with no maintenance and failure of the gates, Gurnard Luck stream will divert and flow over Marsh Road, flooding Marsh Road properties.

From Gurnard Luck the village of Gurnard continues along the cliff top to the east and central Gurnard forms the seafront at the western end of the Cowes-Gurnard seawall.

Defences extend from Gurnard eastwards to Cowes and the mouth of the Medina Estuary. During periods of high spring tide/swell, areas of seawall backed by wide roads and parades are locally overtopped causing flooding.

The centre of Gurnard Bay and the towns of Cowes and East Cowes are both significant waterside communities, with important commuter links to the mainland and are linked by a 'floating bridge' chain ferry, which is at risk from coastal flooding and erosion. West Cowes and East Cowes suffers from localised flooding during periods of high spring tides/swell.

Tidal flood risk at both Cowes and East Cowes is mitigated by an ad hoc series of both private and public seawalls and quays, some of which also provide recreational access to the Solent. These defences provide only a moderate standard of protection (1 in 25 years).

On the eastern shore of the Medina Estuary mouth, the shoreline defences around the town of East Cowes tends to be low concrete and masonry walls, similar to Cowes Parade and Harbour. This urban area is at risk principally from significant coastal flooding and overtopping.

The CFMP states that '*The River Medina and Gurnard Luck can flood from a number of causes. Both rivers are responsive to rainfall and both are affected by tide locking. Potential flood levels at Newport and Gurnard are particularly sensitive to future sea level rise due to a number of low lying properties. The scale of flood risk in this subarea is such that estimated property damages are relatively high in comparison to other parts of the catchment because of the significant population in the catchment. The relatively high number of properties at risk means that flood*

risk management activities are employed and existing defences which protect Newport and Gurnard need to be maintained'.

15.4 Likely Future Conditions

It is likely that with increasing development pressures, water resources will be compromised. With new development the proportion of impermeable surfaces is likely to increase leading to heightened runoff, especially as a result of high soil percentage runoff and low infiltration potential of soils. This will be exacerbated by the fact that infiltration SuDS may be unsuitable at West Wight. Increased runoff is likely to mobilise pollutants and therefore compromise water quality. Similarly, an increased frequency of extreme weather events such as flash floods is likely to further mobilise pollutants as well as contributing to surface water flooding. Surface water flooding is therefore likely to become increasingly common, especially as a result of the under capacity of drainage systems.

New developments may also put pressures on water resources when considering that water from the mainland is imported via an under-sea pipeline which supplies approximately 25% of the island's water demand.

Over time the effects of climate change are also likely to increase. For West Wight this is likely to result in further sea-level rise which may cause coastal erosion and tidal flooding. This effect is increasingly likely as a result of degraded coastal defences many of which are rapidly deteriorating and some of which have already been subject to breach and overtopping.

A number of these potential future impacts are likely to have 'knock-on' effects on other social, environmental and economic systems such as the economy. However, the main aim of the Strategy is to protect and enhance the coastline and its assets and is therefore likely to mitigate adverse impacts which may arise over time as a result of climate change and development for instance.

15.5 Key Environmental Issues

The key environmental issues for water in West Wight are identified as:

- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment;
- Sea level rise of up to 0.752m by 2115 is projected;
- The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities;
- There are four designated bathing waters all of which achieved the 'higher' standard as outlined in the Bathing Water Directive;
- Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland;
- There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation;
- There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes. A number of flood incident reports have been produced in response to these events;
- There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar;
- Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding;

- Similarly, the infiltration potential of soils is considered to be low;
- Due to high runoff and low soil leaching potentials in much of West Wight, the suitability of infiltration SuDS techniques needs to be assessed for new developments and therefore additional mitigation methods may have to be explored and incorporated to prevent increased flood risk on and off-site; and,
- The coastal strategy joins a suite of resources which aim to protect and enhance the coastal and water environment and it is therefore likely that a number of potential adverse impacts will be mitigated and/or avoided by the suggested measures contained within the Strategy.

15.6 Appraisal Findings

The SEA determined that there will be no significant or minor impacts associated with water quality across the entire project frontage as a result of the implementation of the Strategy.

15.7 Proposed Mitigation

As the appraisal found there to be no impact upon water quality and resources across the entire project frontage, mitigation measures are not proposed.

15.8 Proposed Monitoring

In order to facilitate the sustainable future management of water resources across West Wight in the future, a monitoring framework with the following indicators is proposed:

- Standard of coastal defence
- WFD objectives achieved on watercourses where measures have been implemented
- Consultation with the Environment Agency regarding ecological and chemical status of waterbodies

16. Cumulative Effects

16.1 Introduction

Cumulative effects arise where several (perhaps insignificant) effects combine to create a significant impact; or where several individual effects of a plan have a combined effect, either adversely or beneficially.

Guidance on the principles of assessing cumulative effects recommends that the assessment:

- Focusses on the total effect of both direct and indirect effects on receptors (such as biodiversity, water, cultural heritage, etc.);
- Takes into account the nature and extent of the receptors, such as ecosystems and communities, rather than administrative boundaries;
- Takes into account the effects of proposals with the Strategy and those which may result from interaction with the effects of other plans, programmes or strategies; and,
- Is aware of and documents any uncertainties.

Given the number of plans, programmes and action plans being undertaken through other organisations, and their associated management activities for each environmental topic, there is potential for cumulative effects with the Strategy.

The information provided in the review set out in Appendix B was used as a basis for cumulative effects assessment. Professional judgment was also used to identify effects arising from these plans which may have cumulative effects with the Strategy. Particular attention was given to those effects which may be insignificant within individual plans, but cumulatively may be potentially significant.

It should be noted, however, that many of the relevant plans and programmes which have been reviewed in Appendix B are reported at a strategic level, and therefore do not directly relate to physical changes or actions 'on the ground'. The level of risk and uncertainty associated with cumulative effects increases at a higher strategic level because the scale is broader and environmental issues are larger.

The level of uncertainty in predicting effects and determining significance is due to:

- Variation in natural systems and interactions across West Wight and the wider environment;
- A lack of information or knowledge regarding cause-effect relationships; and,
- The inability of predictive models to accurately represent complex systems.

It has been concluded that where beneficial impacts have been identified, cumulative impacts may arise from other Strategies, plans and/or programmes which has similar aims. Likewise, a failure to implement such Strategies, plans and programmes may have adverse cumulative effects.

Cumulative effects may also be synergistic. For instance if two or more strategies, plans and/or programmes implement habitat restoration as part of their flood risk management efforts, the results may be greater than the sum of their parts, giving rise to green corridors, and therefore affording a wider range to flora and fauna.

16.2 Cumulative Effects Appraisal

In the assessment, The Strategy was recorded as likely to have significant effects on the following topics:

- Health; and,
- Material assets.

Similarly, minor effects were identified for the following topics:

- Biodiversity;
- Cultural Heritage/Historic Environment;
- Landscape; and,
- Geology and Soils.

In addition to the significant effects identified in each of the chapters listed above, interactions have been identified between several of the topics. However, an interaction does not necessarily result in a cumulative effect, especially when the identified effects are already significant. Many topics have the potential to interact with each other given that they do not occur in isolation.

For example, beneficial effects have been identified for both health and material assets and these topics can be considered to interact on the basis that a person's health can often be affected by their surroundings e.g. their home or place of employment. However, although this interaction is identified, it is considered that there is no cumulative effect given that both topics would be afforded significant benefits individually as a result of the implementation of The Strategy.

Similarly, interactions have been identified between the historic environment, biodiversity, material assets and subsequently the implications these receptors have for the maintenance of the iconic landscape of West Wight. For instance, where a failure in defences may adversely impact the heritage environment, result in the degradation of nature designations and contribute to the deterioration of the built environment, this may have a cumulative, adverse impact upon the landscape. However, the preferred options of the Strategy prevent this from occurring.

In summary, whilst interactions are apparent amongst the environmental receptors, it is unlikely that cumulative impacts will arise, largely as a result of the holistic and sustainable nature of the preferred options which aim to derive multiple benefits.

16.3 In-Combination Effects

There is also the potential for in-combination effects between The Strategy and other plans and programmes affecting the area. An assessment of the related plans, policies and programmes identified in the SEA Scoping Report established cumulative effects with those listed in Table 16-1 below.

Table 16-1: Other plans and programmes which may have in-combination effects with the Strategy	
Other plans and programmes	**Likely in combination effects with the Strategy**
Isle of Wight Core Strategy (2012)	The West Wight Strategy will support the following Core Strategy aims and policies: - To support sustainable and thriving communities that enable people to enjoy a quality of life, without compromising the quality of the environment; - To promote and enhance community leisure and recreational facilities; - DM1: Sustainable Build Criteria for New Development; - DM2: Design Quality for New Development; and, - DM7: Social and Community Infrastructure.
Biodiversity Action Plan for Hampshire	The West Wight Strategy will support the aims of the Hampshire Biodiversity Action Plan.
The 'Solent Waders and Brent Goose Strategy' (2010)	The West Wight Strategy will support nature conservation designations of Ramsar sites etc. and therefore support the Brent Goose strategy.
People for Nature, Nature for People (2005)	The West Wight Strategy will support the aims of the Local Biodiversity Action Plan.
Biodiversity Action Plan for the Isle of Wight	The West Wight Strategy will support the aims of the Isle of Wight Biodiversity Action Plan
The Isle of Wight Historic Environment Action Plan (HEAP) (2008)	Upon mitigation measures being put in place for heritage assets (particularly in relation to the Needles Battery Site and Fort Albert) the West Wight Strategy will support the Isle of Wight HEAP objectives.
The Isle of Wight AONB Management Plan (2014-2019)	The West Wight Strategy will support AONB Management aims and objectives.
Isle of Wight Joint Strategic Needs Assessment	The West Wight Strategy will support the Joint Strategic Needs Assessment by encouraging enhanced access, protecting material assets etc. all of which enhance human health and wellbeing.
Eco-Island Sustainable Community Strategy 2008	The West Wight Strategy will support the Eco-Island Sustainable Community Strategy by encouraging enhanced access, protecting material assets etc. all of which enhance human health and wellbeing.
The Isle of Wight Local Geodiversity Action Plan (LGAP) (2010)	Through protecting geological and soil resources, the West Wight Strategy will support the aims and objectives of the Isle of Wight Local Geodiversity Action Plan.
South East River Basin District Flood Risk Management Plan (FRMP) Scoping Report (2014)	Through facilitating a reduction in tidal flooding and coastal erosion, the West Wight Strategy will support the aims and objectives of the South East River Basin District Flood Risk Management Plan Scoping Report.

Isle of Wight Catchment Flood Management Plan (CFMP) (2009)	Through facilitating a reduction in flooding, the West Wight Strategy will help to deliver the aims and objectives of the Catchment Flood Management Plan.
Isle of Wight Shoreline Management Plan 2(SMP) (2011)	The West Wight Strategy builds upon SMP 2 and consequently aims to deliver associated aims and objectives including: • To reduce the threat of flooding and coastal erosion to people and their property; and, • To deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles.
Isle of Wight North-East Coastal Defence Strategy Study (2005)	The West Wight Strategy builds upon this study and facilitates the delivery of effective coastal defence schemes.

17. Consultation and Next Steps

17.1 Consultation

The SEA Directive requires that the public, together with certain environmental bodies: *"be given an early and effective opportunity within appropriate time frames to express their opinion on the draft plan or programme and the accompanying environmental report"* (Article 6(2)).

The Environmental Report was sent to the statutory SEA consultees (Natural England, Environment Agency and English Heritage/Historic England) for comment as part of The Coastal Strategy consultation.

The Environmental Report was intended to inform stakeholder consultation. When the statutory consultation period was completed, the comments received were considered and informed the environmental assessment of the strategic coastal defence options and the preparation of the final version of this Environmental Report.

Responses to the three-month consultation in Spring 2016 are shown in full in Appendix E, along with a record of amendments made.

17.2 Next Steps

Once The Strategy has been adopted, the SEA Statement required by the SEA Regulations will be provided by the Isle of Wight Council.

18. Appendix A: Consultation Responses

Consultation responses were received from both non-statutory and statutory consultees to the initial consultation. Responses from statutory consultees and subsequent alterations are outlined below. Where possible every effort has been made to incorporate recommendations made.

Please note: Responses to the later stage of the full three-month consultation in Spring 2016 are shown in full in Appendix E, along with a record of amendments made.

Comments Received	Actions Taken
English Heritage	
Response not received.	
Natural England	
“Solent and Southampton SPA" add "water". Also for clarity suggest that the section states that the Medina estuary is also SAC as this is currently ambiguous”	Update has been made.
“Could be clearer that Newtown Harbour is within the SPA/Ramsar/SAC as well as NNR”.	Update has been made.
“Wouldn’t landslips and coastal erosion be considered to be landscape features of this part of the IoW?” A change is not proposed and this comment remains an observation.	Information relating to landslides and coastal erosion remains in the soil and geology section yet the interconnectivity and implications of landslides and erosion upon landscape has been considered.
“There are a number of geological SSSIs which in order to achieve favourable condition requires some erosion to maintain exposures. It may be worth highlighting this”.	Information has been added.
Environment Agency	

Comments Received	Actions Taken
Fisheries "There is no reference to fisheries throughout the scoping report. The Solent and Southampton Water and its associated estuaries are key environments on the migratory route for Atlantic Salmon and Sea Trout. Watercourses on the West Wight are known to support resident wild Brown Trout. Both Trout and Salmon are protected by current fisheries and nature conservation legislation and can be at risk from certain activities, particularly those that have effects on water quality. The seasonal nature of salmonids should therefore be considered when assessing impacts. The Strategy should also assess the potential impacts upon eels and make reference to the Eel Regulations 2009".	Information has been added.
Shellfish "We note that there is no reference to shellfish. Section 11.5 on Key Environmental Issues mentions Bathing Water compliance of designated bathing waters and WFD compliance of freshwater water bodies ("moderate as a result of high nutrient quantities") but makes no reference to relevant transitional and coastal (TraC) WFD water bodies. The TraC water bodies include designated shellfish waters (Protected Areas under WFD) some of which fail for reasons including diffuse pollution. Like the freshwaters, several TraC water bodies are affected by high nutrients".	Information has been added.
The SEA states that a Water Framework Directive Assessment will be required at the Strategy level and that this will include an assessment of all water bodies that could be affected by the implementation of the Strategy, including an assessment of their current water quality. We assume that the transitional and coastal WFD water bodies will be included in this.	Information has been added.
"The Strategy should be aware of the 'Seaview' project. This project run by the Solent Forum that aims to define what WFD "Good Potential" would look like in the Solent area".	Information has been added.

Comments Received	Actions Taken
“The scoping strategy does not make reference to the proposed Marine Conservation Zone (MCZ) and should do so. The Needles zone has been put forward as a proposed MCZ in tranche 2 of the designations. Please see the link below to the recent public consultation document. Part F of the consultation outlines management implications. https://consult.defra.gov.uk/marine/tranche2mczs”	Information has been added.

19. Appendix B: Full Policy Review

Plan	Description	SEA Topics
International		
SEA Directive (2001) Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment	Contributes to the high-level environmental protection and the consideration of environmental issues in the preparation and adoption of plans and programmes with the intent of promoting sustainable development.	All
The Johannesburg Declaration of Sustainable Development (2002)	Commits the nations of the world to sustainable development.	All
Arhus Convention (1998) (Convention on Access to Information, Public Participation in decision –making and Access to Justice in environmental Matters)	Links environmental rights and human rights. Acknowledges that we owe an obligation to future generation. Establishes that sustainable development can be achieved only through the involvement of all stakeholders. Links government accountability and environmental protection. Focuses on interactions between the public and public authorities in a democratic context.	All
Convention on Biological Diversity (1992)	Sets the target to achieve by 2010 a significant reduction of the current rate of biodiversity loss. The Strategic Plan for Biodiversity 2011-2020, including Aichi Biodiversity Targets, forms the overarching framework on biodiversity.	Biodiversity
Bern Convention	The main aims of the Convention are: to ensure conservation and protection of wild plant and animal species and their natural habitats; to increase cooperation between contracting parties, and to regulate the exploitation of those species.	Biodiversity
The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1985	Contracting Parties work together to share research and conserve migratory species and their habitats by providing strict protection for endangered migratory species.	Biodiversity
The Habitats Directive (92/43/EEC)	Requires the protection of species and habitats of EU nature conservation designation. The Directive requires that development can only be allowed where it does not impact on important sites that protect habitats otherwise compensation measures must be put in place.	Biodiversity

Plan	Description	SEA Topics
The Birds Directive 2009/147/EC (codified version of 79/409/EEC)	Provides for the protection of all naturally occurring wild bird species and their habitats, with particular protection of rare species. The Directive requires that measures are taken to preserve, maintain or re-establish a diversity of habitats for all the birds listed in Article I.	Biodiversity
Our life insurance, our natural capital: an EU biodiversity strategy to 2020 COM(2011) 244 final	Headline target is to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and to restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss.	Biodiversity
The European Landscape Convention 2000 (signed 2006)	Promotes various actions at the landscape scale ranging from strict conservation through protection, management and improvement to creation.	Biodiversity, Material Assets and Cultural Heritage
EU Floods Directive (2007)	The aim of the Directive is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity.	All
Air Quality Directive (2008/50/EC) and Air Quality Standards Regulations (2010)	The Directive on ambient air quality and cleaner air merged most existing legislation in to a single directive and sets limits for concentrations of pollutants in outdoor air. The Air Quality Standards Regulations (2010) transpose into English law the requirements of Directives 2008/50/EC and 2004/107/EC on ambient air quality.	Air, Human Health, Biodiversity
The Industrial Emissions Directive (2010) Directive 2010/75/EU on Industrial Emissions (Integrated Pollution Prevention and Control)	Provides rules for the delivery of integrated prevention and pollution of pollution arising from industrial activities designed to prevent or, where not practical, reduce emissions into air, water and land as well as to prevent the generation of waste to achieve a high-level of protection of the environment. Emission limit values are set for substances harmful to air or water.	Not applicable
The Water Framework Directive (2000/60/EC)	Promotes an integral and coordinated approach to water management at the river basin scale. Also encourages protection of soil and biodiversity. It aims to: Prevent deterioration of aquatic ecosystems and associated wetlands; Promote the sustainable use of water; Reduce pollution of water; and introduce a co-ordinated approach to water management based on the concept of river basin planning.	Biodiversity, Water
The Drinking Water Directive (1998) Directive 98/83/EC on the quality of water intended for human consumption	Seeks to protect public health by reducing the risk of the contamination of water intended or human consumption. Member States to set values for water intended for human consumption.	Water

Plan	Description	SEA Topics
The Floods Directive (2007/60/EC) on the assessment and management of flood risks	Aims to reduce and manage the risks that floods pose to human health, environment, cultural heritage and economic activity. Requires Member States to undertake a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. Where necessary flood risk maps are to be produced by 2013 with flood risk management plans focused on prevention, protection and preparedness being in place by 2015.	Water, Human Health, Biodiversity, Cultural Heritage
Urban Wastewater Treatment Directive (1991)	Aims to protect the environment from the adverse effects of wastewater discharges through a requirement for the secondary treatment of urban wastewater.	Water
The Nitrates Directive (1991) Directive 91/676/EEC on nitrates from agricultural sources	Seeks reduction of water pollution caused or induced by nitrates from agricultural sources and prevent further pollution.	Water
The Waste Framework Directive (2008), Hazardous Waste Directive (1991) IPPC Directive (1996) and Landfill Directive (1999)	Aims to ensure that all necessary measures have been taken to ensure that waste is recovered or disposed of without causing harm to human health or the environment	Human Health
World Heritage Convention (1972)	Calls for the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage sites.	Cultural Heritage
The Convention for the Protection for the Architectural Heritage of Europe (The Granada Convention)	The main purpose of the Convention is to reinforce and promote policies for the conservation and enhancement of Europe's heritage. It also affirms the need for European solidarity with regard to heritage conservation and is designed to foster practical co-operation among the Parties. It establishes the principles of 'European co-ordination of conservation policies' including consultations regarding the thrust of the policies to be implemented.	Cultural Heritage
The European Convention on the Protection of Archaeological Heritage (The Valetta Convention)	The revised Convention updates the provisions of a previous Convention (ETS No. 66) adopted by the Council of Europe in 1969. The new text makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies. It is concerned in particular with arrangements to be made for co-operation among archaeologists and town and regional planners in order to ensure optimum conservation of archaeological heritage.	Cultural Heritage

Plan	Description	SEA Topics
	The Convention sets guidelines for the funding of excavation and research work and publication of research findings. It also deals with public access, in particular to archaeological sites, and educational actions to be undertaken to develop public awareness of the value of the archaeological heritage.	
Adapting to Climate Change: Towards a European framework for Action (2009)	Promote strategies that increase the resilience to climate change of health, property and the productive functions of land, inter alia by improving the management of water resources and ecosystems. Framework for adaptation measures and policies to reduce the European Union's vulnerability to the impacts of climate change. The White Paper outlined the need for establishing a Clearing House Mechanism by 2011 that would enable exchanging information on climate risks, impacts and best practices between government, agencies and organisations working on adaptation policies.	Climate Change
European Commission Thematic Strategy for Soil Protection (2006)	Promotes the protection and sustainable use of soil.	Soil
European Commission Thematic Strategy on the prevention and recycling of waste (2005)	Overall aim of Europe becoming a recycling society that seeks to avoid waste and uses waste as a resource.	Soil
National		
Flood Risk Regulations (2009) (SI 3042)	Sets duty on Environment Agency and lead local flood authorities to prepare preliminary assessment maps and reports for river basin districts and flooding. A further duty is to identify flood risk areas and prepare flood risk management plans.	All
UK National Heritage Protection Plan	The National Heritage Protection Plan (NHPP) sets out how English Heritage, together with partners in the heritage sector, will prioritise and deliver heritage protection from 2011 to 2015.	Cultural Heritage
Government White Paper: Heritage protection for the 21st Century	Aims to protect National Heritage in the 21st Century and capitalise upon the benefits which this heritage affords.	Cultural Heritage
Environmental Protection Act 1990	Protects the Environment from pollutions and wastes which have the potential to result in the declining quality of the natural environment.	All
Making Space for Water (2005)	Advocates a holistic approach to flooding, addressing all types of flooding together. The results of The Strategy will be seen on the ground in the form of more flood and coastal erosion solutions working with natural processes. This will be achieved by	Water

Plan	Description	SEA Topics
	making more space for water in the environment through, for example, appropriate use of realignment to widen river corridors, areas of inter-tidal habitat and multi-functional wetlands that provide wildlife and recreational resource and reduce coastal squeeze on habitats like saltmarsh. Flood and coastal erosion risk management will be clearly embedded across a range of Government policies, including planning, urban and rural development, agriculture, transport, and nature conservation and conservation of the historic environment. There will be a mix of policies designed to minimise the creation of new risks (by the way development policy is implemented in areas of flood risk), to manage risk and to increase resistance and resilience.	
Planning Policy Guidance: Flood Risk and Coastal Change	Advises developers as to how flood and water management should be considered when planning developments.	Water, Material Assets
Land Drainage Act (1991)	Stipulates the requirements for adequate land drainage and associated responsibilities.	Water, Material Assets
Flood and Water Management Act (2010)	The Act Section 21 sets a duty on the Lead Local Flood Authority (LLFA) to maintain a register of structures or features, and a record of information about each of those structures or features, which, in the opinion of the authority, are likely to have a significant effect on flood risk in its area helping to improve our understanding and management of local flood risk. Section 30 allows the Environment Agency, LLFAs and Internal Drainage Boards (IDBs) to designate natural or artificial features that are important for flood or coastal erosion risk management. The effect of a designation is that a feature may not be altered, replaced or removed without consent. A new regulation will require all LLFA's to asses all drainage designs prior to construction to determine whether the design meets national sustainable drainage standards.	All
National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England (2011)	Sets out a statutory framework that will help communities, the public sector and other organisations to work together to manage flood and coastal erosion risk. Aim is to ensure that flooding and coastal erosion risks are well-managed and co-ordinated. The strategy covers flooding from the sea, rivers, surface water, sewers, groundwater and reservoirs.	All

Plan	Description	SEA Topics
Guidance for risk management authorities on sustainable development in relation to their flood and coastal erosion risk management (Defra, 2011).	Provides guidance on how authorities can contribute towards achievement of sustainable development when exercising flood and coastal erosion risk management functions, as required by the Flood and Water Management Act (2000)	All
Appraisal of flood and coastal erosion risk management (Defra, 2009)	Sets out the principles that should guide decision-making on the sustainable management of flood and coastal erosion risk in England. In particular it emphasises the need to ensure that appraisals for all activity (whether strategic level plans or individual projects): - Give more consideration to 'risk management' and 'adaptation', as opposed to only 'protection' and 'defence'; - Are undertaken consistently, transparently, with value for money in mind and in a way that complies with the Treasury guidance on appraisal and evaluation in central Government (The Green Book); - Help achieve better social and environmental outcomes as part of sustainable development, both by considering a broader range of issues and by using a broader range of analysis techniques; - Adopt a risk-based approach, whilst considering impacts within the whole of a catchment or shoreline process area.	All
Future Water – The Government's Water Strategy for England (Defra, 2008)	Recognises that poor surface water management can cause water quality problems. The Government vision for water policy and management is one where, by 2030 at the latest, we have: - Improved the quality of our water environment and the ecology which it supports, and continued to provide high-levels of drinking water quality from our taps. - Sustainably managed risks from flooding and coastal erosion, with greater understanding and more effective management of surface water. - Ensured a sustainable use of water resources, and implemented fair, affordable and cost reflective water charges. - Cut greenhouse gas emissions. - Embedded continuous adaptation to climate change and other pressures across the water industry and water users.	Water
Groundwater Protection Policy & Practice (EA, 2006)	Facilitates the protection of groundwater.	Water

Plan	Description	SEA Topics
Groundwater (England and Wales) Regulations (2009)	Seeks to prevent or limit the input of pollutants into groundwater.	Water
Water Act (2003)	Encourage more efficient use of water resources	Water
Groundwater Regulations (2009)	Outlines the authorities responsible for groundwater matters.	Water
Water Industry Act (1991)	An act which consolidates enactments relating to the supply and provision of water and sewerage services.	Water
Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (SI 3242)	- Aims to improve water quality and promote the sustainable use of all UK waterbodies, including coastal waters, estuaries and all inland waterbodies; - It requires all UK river basins to reach 'good status' by 2015, through demanding environmental objectives, including chemical, biological and physical targets; - Charged the Environment Agency with production of River Basin Management Plans to be implemented by end of 2009; - Three types of UK water quality standards are being developed (a formal classification instrument should be completed in late 2007): Priority substances (and Priority Hazardous Substances); Specific Pollutants; and Physico-chemical pollutants.	Water, Biodiversity
Water for Life White Paper (2011)	Recognises that water resources are already under pressure and that future changes such as climate change and demographic change, will exert further pressure. Government objectives include: - Paint a clear vision of the future and create the conditions which enable the water sector and water users to prepare for it - Deliver benefits across society through ambitious agenda for improving water quality, working with local communities to make early improvements on the health of our rivers by reducing pollution and tackling unsustainable abstraction - Work with water companies, regulators and other stakeholders to build understanding of the impact personal choices have on the water environment, water resources and costs; - Set out roles and responsibilities – including where Government will take a stronger role in strategic direction setting and assessing resilience to future challenges, as well as clear expectations on the regulators.	Water, Biodiversity

Plan	Description	SEA Topics
UK Post-2010 Biodiversity Framework	UK Response to the Convention on Biological Diversity covers the period from 2011 to 2020. Sets out national and local biodiversity action plans. In the absence of empirical data to support a trend we can use contextual information such as developments (land claim, marina developments, sea level rise....) to aid judgement of trends. From this it seems likely that mudflat extent in the UK is declining. UK coastal habitats and their associated species face a number of pressures and threats, which conservation initiatives are trying to address. The coastline has been subject to urban development, land-claim for agriculture and industry, recreational pressure, and changing agricultural use. Conservation designations, improved site management and planning policies have reduced some of these threats, but port and other transport developments remain issues. An increasingly important issue, especially on soft coasts, is 'coastal squeeze', i.e. where the extent of saltmarsh is diminishing as it is 'squeezed' between flood defences and rising relative sea levels.	Biodiversity
Working with the Grain of Nature: A Biodiversity Strategy for England (2002)	Ensure biodiversity considerations become embedded in all the main sectors of economic activity, public and private	Biodiversity
Strategic Framework and Policy Statement on Improving the Resilience of Critical Infrastructure to Disruption from Natural Hazards (2010)	Sets approach to managing risk to infrastructure: - Build a level of resilience into critical infrastructure assets that ensures continuity during a worst case flood event. - Considering the threat from current and future natural hazards in the design of new assets. - Increase the robustness and resilience of existing services or assets by building additional network connections. - Identifying key components and moving them out of harm's way. - Improved arrangements for sharing of information on infrastructure network performance and standards. - Enhancing skills and capabilities to respond to emergencies arising from natural hazards.	Material Assets
National Infrastructure Plan (2010)	The plan estimates a 20% increase in congestion by 2025 and suggests changes to how infrastructure is planned, coordinated and delivered with adaptation to provide security and resilience. Private sector capital is to be attracted and the cost of capital for projects needs to be reduced.	Material Assets

Plan	Description	SEA Topics
Consultation Draft Waste Management Plan for England (2013)	Aims to deliver the objectives of the revised Waste Framework Directive: to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such waste. There are comprehensive waste management policies in England, which taken together deliver the above objectives, the core of this policy is therefore to bring current policies under the umbrella of one national plan.	Material Assets
Safeguarding our Soils: A Strategy for England (2009)	Policy which acts to protect national soil resources in a bid to capitalise upon the vast amount of ecosystem services which it delivers.	Geology and Soils
Directive 99/31/EC, Landfill Regulations (2002) and Amendment (2005)	Sets a series of substantial targets for the reduction of biodegradable municipal waste gong to landfill.	Geology and Soils
Climate Resilient Infrastructure: Preparing for a Changing Climate (May, 2011)	A strategic approach to adapting national infrastructure that can be replicated at the sub-regional and local level by local authorities and the new Local Enterprise Partnerships (LEPs) (see paragraph 3.4.6) is described.	Material Assets
The Carbon Plan (2011)	Outlines the government's approach to reducing greenhouse gas emissions and therefore minimising contributions to global climate change.	Climate Change
UK Climate Impacts Programme (2009)	Updated climate change projections based on three global emission scenarios provide forecasts for a climate and weather related impacts.	Material Assets
Climate Change: The Climate Change Act (2008)	Requires that the average annual emissions in the carbon budget period including the year 2020 (i.e. the third period, 2018-2022) are at least 34% below the 1990 baseline. This is a 34% reduction by 2020. The 2008 Planning Act placed a duty on local authorities to include policies on climate mitigation and adaptation.	Material Assets
National Adaptation Plan (2013)	Meets the requirements of the Climate Change Act (2008). Objectives have been developed to address the greatest risks and opportunities: - Increasing awareness; - Increasing resilience to current extremes; - Taking timely action for long-lead time measures; and - Addressing major evidence gaps.	Material Assets

Plan	Description	SEA Topics
The Wildlife & Countryside Act (1981) as amended (most notably by the Countryside and Rights of Way (CRoW) Act (2000)	Principal instrument for the protection of Sites of Special Scientific Interest and endangered wildlife within the UK. The CRoW Act aims for increased public access to the countryside and strengthens protection for wildlife.	Biodiversity
Biodiversity 2020: A Strategy for England's wildlife and ecosystem services (2011)	Ensures biodiversity considerations become embedded in all the main sectors of economic activity, public and private. It sets out the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea.	Biodiversity
Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network (Defra, 2010)	Sets out five approaches to deliver a coherent, resilient ecological network: - improve the quality of current site by better habitat management; - increase the size of current wildlife sites; - enhance connections between, or join up, sites wither through physical corridors, or though 'stepping tones'; - create new sites; and - reduce the pressures on wildlife by improving the wider environment, including through buffering wildlife sites.	Biodiversity
The Natural Choice: Securing the Value of Nature. The Natural Environment White Paper. (HM Government, 2011)	Sets out the Government's plans to ensure the natural environment is protected and fully integrated into society and economic growth. Sets out four key aims: - protecting and improving our natural environment; - growing a green economy; - reconnecting people and nature; and - international and EU leadership.	Biodiversity
UK National Ecosystem Assessment (2011)	The first analysis of the UK's natural environment and the benefits it provides to society and economic prosperity. The assessment leads on from the Millennium Ecosystem Assessment (2005) analyses services provided by ecosystem against eight broad habitat types. The ecosystem services provided by these habitat types have been assessed to find their overall condition.	Biodiversity
Ancient Monuments and Archaeological Areas Act (1979)	Provides for nationally important archaeological sites to be statutorily protected as 'Scheduled Ancient Monuments' (now Scheduled Monuments)/	Cultural Heritage

Plan	Description	SEA Topics
Planning (Listed Buildings and Conservation Areas) Act (1990)	Provides specific protection for buildings and areas of special architectural or historic interest	Cultural Heritage
The Historic Environment: A Force for Our future (2001)	Sets out the intention to protect the historic environment as in contribution to the economy.	Cultural Heritage
Climate Change and the Historic environment (2008)	Sets out English Heritage's current views on the implications of climate change for the historic environment. It recognises that adaptations and mitigation to address the causes and consequences of climate change can have a damaging effect on historic buildings, sites and landscapes.	Cultural Heritage
The UK Climate Change Programme (2006) and the Climate Change Act (2008)	A suite of new and established measures to reduce UK carbon emissions to 15-18% below 1990 levels by 2010. Also promotes anticipatory adaptation. The Climate Change Act legislates for climate change mitigation and adaption. It sets the requirements for the Climate Change Risk Assessment, the National Adaptation Programme and the Adaptation Reporting Power.	Biodiversity, Material Assets and Cultural Heritage
Countryside and Rights of Way Act (2000)	Provides for public access on foot to certain types of land, amends the law relating to public rights of way, increases protection for Sites of Special Scientific Interest and strengthens wildlife enforcement legislation as well as provides for the management of Areas of Outstanding Natural Beauty.	Biodiversity, Human Health
Conservation of Habitats and Species (2010)	Consolidates the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 in respect of England and Wales and promotes the conservation of designated species and their habitats.	Biodiversity
Marine and Coastal Access Act (2009)	Aims to protect and enhance the habitats and species in marine and coastal areas nationally.	Biodiversity
Waste Strategy for England (2007)	Promotes best practicable environmental option (BPEO), the waste hierarchy and the proximity principle. The strategy sets out an overall objective for England to achieve less waste, more material recovery, energy from waste and much less landfill.	Material assets
Healthy Lives: Healthy People: Our Strategy for Public Health in England	Helping people live longer and reduce health inequalities.	Human Health

Plan	Description	SEA Topics
(Department of Health, 2010)		
Natural Environment and Rural Communities Act (2006)	Promote and enhance biodiversity. The Act stresses that biodiversity conservation should not be viewed solely as an environmental issue, but a core component of sustainable development, which underpins economic development and prosperity and offers a range of quality of life benefits across a range of local authority service areas.	Biodiversity
National Planning Policy Framework (2012)	Sets out how planning should contribute to sustainable development. The Government is committed to protecting and enhancing the quality of the natural and historic environment, in both rural and urban areas. A high-level of protection should be given to most valued townscapes and landscapes, wildlife habitats and natural resources. Those with national and international designations should receive the highest level of protection. Development plan policies should take account of environmental issues such as the potential impact of the environment on proposed developments by avoiding new development in areas at risk of flooding, and as far as possible, by accommodating natural hazards and the impacts of climate change.	All
	Proactive strategies should be adopted to mitigate and adapt to climate change, taking full account of flood risk and water supply and demand considerations.	Biodiversity, Material Assets and Cultural Heritage
	The planning system should contribute to and enhance the natural and local environment by: - recognising the wider benefits of ecosystem services; - minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.	Biodiversity
	Heritage assets are an irreplaceable resource and should be conserved in a manner appropriate to their significance.	Cultural Heritage, Material Assets
	Access to high quality open spaces and opportunities for sport and recreation can	Biodiversity, Human Health, Material Assets

Plan	Description	SEA Topics
	make an important contribution to the health and well-being of communities.	and Cultural Heritage
	The planning system should contribute to and enhance the natural and local environment by: - preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability	Water
	Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change.	Biodiversity, Cultural Heritage, Material Assets, Water
Laying the Foundations: A Housing Strategy for England (DCLG, 2011)	Supports the delivery of new homes and improvement of social mobility.	Material Assets
Delivering Affordable Housing (DCLG, 2006)	Supports local authorities and others in delivering high quality affordable housing within mixed sustainable communities.	Not applicable
Planning Policy for Traveller Sites (DCLG, 2012)	Set out the following Government aims for traveller sites: - That local planning authorities should make their own assessment of need for the purpose of planning; - Ensure that local planning authorities work collaboratively to develop strategies to meet needs through the identification of land for traveller sites.	Not applicable
Securing the Future: UK Government Sustainable Development Strategy (2005)	This replaced an earlier strategy published in 1999 and aims to enable people to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations	All
Rural White Paper (2000) Our Countryside: The Future – A fair Deal for Rural England.	Promotes sustainable rural economies with the objective of maintaining and stimulating secure access to services and employment as well as conserving and enhancing rural landscapes.	Landscape, Biodiversity, Cultural Heritage.
Urban White Paper (2000) Our Towns and	Seeks to encourage more sustainable and attractive urban areas to retain people	All

Plan	Description	SEA Topics
Cities: The Future – Delivering an Urban Renaissance	in urban areas. Sets target of 60% of new homes to be on brownfield sites.	
The UK Renewable Energy Strategy (DECC, 2009)	Promotes increased use of renewable electricity and heat as well as promotes a low-carbon economy, energy security to address climate change. Sets target of 15% of energy to be from renewable sources by 2020 with reduced CO_2 emissions by 750 Mt by 2030.	Material assets
Flooding and Historic Buildings (English Heritage, 2010)	This guidance is designed to assist those who live in, own or manage historic buildings that together with their historic fixtures and fittings are threatened by periodic flooding. Advice is provided on preventative measures to minimise flood damage as well as on the inspection, conservation and repair of historic buildings after flooding.	Cultural Heritage
Health and Social Care Act (2012)	Highlights internal structural changes within the NHS in a bid to better deliver healthcare services.	Human Health
Regional and Local		
Isle of Wight Core Strategy (2012)	The Isle of Wight Core Strategy sets policies for a wide range of topics as covered within this SEA Scoping Report. Examples of policies and objectives related to the Isle of Wight assets and topics covered include: - To support sustainable and thriving communities that enable people to enjoy a quality of life, without compromising the quality of the environment; - To ensure that housing is provided to meet the needs of island residents; - To promote and enhance community leisure and recreational facilities; - DM1: Sustainable Build Criteria for New Development; - DM2: Design Quality for New Development; - DM3: Balanced Mix of Housing; - DM4: Locally Affordable Housing; - DM7: Social and Community Infrastructure; - DM19: Waste; and, - DM21: Utility Infrastructure Requirements.	All

Plan	Description	SEA Topics
Biodiversity Action Plan for Hampshire	Reviews the status of wildlife in Hampshire and sets out a framework for action in two parts. Volume one (the strategic plan) outlines the objectives of the partnership, describes Hampshire's biodiversity, and identifies habitats and species of priority concern. Volume two contains individual action plans for priority habitats and species and topics which have a considerable influence on the conservation of biodiversity.	Biodiversity
The 'Solent Waders and Brent Goose Strategy' (2010)	Provides analysis and recommendations relating to strategic planning within and around the Solent Coast.	Biodiversity
People for Nature, Nature for People (2005)	The Local BAP highlights the importance of the island's rich biological diversity and the benefits which it derives from employment to life-long learning and health. The Plan contains a number of objectives which strive to protect and enhance the natural environment based on six key themes: physical environment, sense of place and environmental quality, health and wellbeing, life-long learning, community spirit and education, and biological diversity.	Biodiversity
Biodiversity Action Plan for the Isle of Wight	The Biodiversity Action Plan comprises a series of documents produced from 2000 to 2005. These plans provide a framework for action to conserve and enhance the biodiversity of the island.	Biodiversity
Monitoring for Biodiversity 2020 on the Island	Encompasses an overview of the state of biological monitoring for the Isle of Wight and a review of priorities.	Biodiversity
Isle of Wight Heritage at Risk in the Medina Valley	A report which highlights the Isle of Wight assets which may be at risk of deterioration, the findings of which can be found in the environmental baseline.	Cultural Heritage
The Isle of Wight Historic Environment Action Plan (HEAP) (2008)	Provides an overview of the Island's historic environment and informs the Isle of Wight HEAP aims, objectives and actions which encourage the protection and enhancement of heritage assets. The overarching aim of the HEAP is to provide community understanding, conservation, and management of the historic environment whilst assisting in the development of strategic planning policy. A separate HEAP was produced in 2008 for the West Wight Cretaceous Chalk Downland which is valued for its significant historic landscape features.	Cultural Heritage
Green Infrastructure Strategy	Upon completion the Strategy will identify, deliver, manage and monitor the Green Infrastructure network and provide detailed guidance and delivery mechanisms for	Biodiversity, Water, Material Assets, Cultural

Plan	Description	SEA Topics
	Green Infrastructure including the identification of areas of opportunity for expansion or improvements to the network. It is likely that the Strategy will build on the identification of green infrastructure assets as undertaken by Isle of Wight Green Infrastructure Mapping Study.	Heritage, Landscape and Human Health
The Isle of Wight AONB Management Plan (2014-2019)	Documents how the Isle of Wight AONBs will be protected and enhanced in the future and has the following objectives: - Highlight the distinctive qualities of the AONB; - Identify the changes and issues affecting the AONB; - Present a vision for the future of the AONB as a whole, in light of other national, regional and local priorities; - Set priorities incorporating specific objectives that will help to secure that vision; - Clarify the role of partners and other stakeholders, identifying what needs to be done, by whom, and when, in order to achieve the plan's objectives; - Identify how the objectives and actions will be measures and reviewed; and, - Raise the profile of the AONB and its purpose. Whilst the Isle of Wight AONB Management Plan largely relates to landscape protection and enhancement, the plan does relate to other disciplines such as the historic environment and sets out a number of objectives relating to the conservation of heritage.	Landscape
Isle of Wight Joint Strategic Needs Assessment	Provides a comprehensive overview of the population's health and wellbeing and enables the Isle of Wight's health and wellbeing board to respond to the needs and priorities identified with the report to enhance public health. This assessment is supported by the Isle of Wight Mental Health Strategy.	Human Health
Eco-Island Sustainable Community Strategy 2008	This strategy has four key themes one of which is *Healthy and Supportive Island* which has the following priorities: - Reduce levels of obesity in all ages; - Improve health, emotional wellbeing and life expectancy across the island; support vulnerable and life expectancy across the island; support vulnerable people to live independent lives; and, - Ensure people of all ages have places to live and things to do in their local area.	All
The Isle of Wight Local Geodiversity Action	The plan has the overarching aim of formulating a strategy to promote the Isle of Wight through the conservation and sustainable development of its Earth Heritage	Cultural Heritage,

Plan	Description	SEA Topics
Plan (LGAP) (2010)	and has the following objectives: - To audit the existing Earth Heritage resource of the Isle of Wight; - To audit existing Earth Heritage interpretation on the Isle of Wight; - To form an action plan to help conserve the Island's Erath Heritage resource; and, - To form an action plan to develop a sustainable way the Island's Earth Heritage Resource to the benefit of the Island community and visitor.	Biodiversity, Water, Landscape, Soil and Geology
Development of potentially contaminated land (2005)	This guidance provides a framework for assessing the risk of land contamination for new developments. Prior to this in 2001 the Isle of Wight Council produced a Contaminated Land Inspection Strategy.	Soil and Geology, Water and Biodiversity
South East River Basin District Flood Risk Management Plan (FRMP) Scoping Report (2014)	This scoping report outlines the approach which will be taken when producing the draft South East River Basin District FRMP. For the Isle of Wight this relates specifically to flooding from main rivers, the sea and coastal erosion risks.	All
Isle of Wight Catchment Flood Management Plan (CFMP) (2009)	The CFMP provides an overview of the flood risks posed across the Isle of Wight catchment and potential mitigation measures both now and over the next 50 to 100 years. The development of a CFMP helps to define flood risk and consequently set policies for the management of flood risk whilst promoting the integration and collaborative working of stakeholders.	All
Isle of Wight Shoreline Management Plan 2(SMP) (2011)	The Isle of Wight SMP comprises a large-scale assessment of the potential risks arising from coastal evolution and outlines a policy framework which has the overarching aim of addressing these risks. The SMP forms part of the Department for Environment, Food and Rural Affairs (Defra) strategy for flood and coastal defence and therefore supports the Government's aims, as set out in Defra's strategy 'Making Space for Water': To reduce the threat of flooding and coastal erosion to people and their property; and' To deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles.	All
Isle of Wight North-East Coastal Defence Strategy Study (2005)	This study assesses the north-eastern coast of the Isle of Wight from Shrape Breakwater at East Cowes to Culver Cliff and builds upon the findings of the original	All

Plan	Description	SEA Topics
	SMP and provides a more detailed assessment of particular frontages in order to determine the most effective coastal defence schemes	

20. Appendix C: Preferred Option Impact Assessment

Key:

Potential significant beneficial effects	Potential minor beneficial effects	Potential beneficial and adverse effects	Potential minor adverse effects	Potential significant adverse effects	Neutral / no effect

20.1 SMZ1: The Needles Headland

Preferred Strategy Option: ***Do Nothing*** *– No Active Intervention. Baseline scenario*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	A 'Do Nothing' approach will enable the natural evolution of nature conservation.	A 'Do Nothing' approach will enable the natural evolution of nature conservation.	A 'Do Nothing' approach will enable the natural evolution of nature conservation.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	There will be no impact along the majority of the frontage regarding Cultural Heritage / Historic Environment	Full or partial loss of Needles Battery Site (SM).	Full or partial loss of Needles Battery Site (SM).
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	The iconic landscape of the Needles and the Alum coloured sands is likely to be maintained, yet the loss of the Needles Battery Site is likely to affect the historic landscape.	The iconic landscape of the Needles and the Alum coloured sands is likely to be maintained, yet the loss of the Needles Battery Site is likely to affect the historic landscape.	The iconic landscape of the Needles and the Alum coloured sands is likely to be maintained, yet the loss of the Needles Battery Site is likely to affect the historic landscape.
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents;	Health and safety obligations relating to the eroding coastline will be accounted for, most likely through private maintenance.	Health and safety obligations relating to the eroding coastline will be accounted for, most likely through private maintenance.	Health and safety obligations relating to the eroding coastline will be accounted for, most likely through private maintenance.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	- Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.			
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	There will be no impact along the majority of the frontage regards to material assets.	There will be no impact along the majority of the frontage regards to material assets.	There will be no impact along the majority of the frontage regards to material assets.
Geology & Soils	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	Geology and soil along is unlikely to be affected.	Geology and soil along is unlikely to be affected.	Geology and soil along is unlikely to be affected.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation; - There are numerous incidents of historic flooding in areas such as	Water quality is unlikely to be affected.	Water quality is unlikely to be affected.	Water quality is unlikely to be affected.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			

20.2 SMZ2: Totland and Colwell Bays

Preferred Strategy Option: ***Do Minimum-*** *Maintain H&S and access as long as possible and develop coastal change management area plan (W2-W6)*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	There are likely to be minor beneficial impacts in regards to nature conservation, for instance the Colwell Bay SSSI would maintain important geological exposures and the Solent Maritime SAC may benefit from an increased availability of sediment.	There are likely to be minor beneficial impacts in regards to nature conservation, for instance the Colwell Bay SSSI would maintain important geological exposures and the Solent Maritime SAC may benefit from an increased availability of sediment.	There are likely to be minor beneficial impacts in regards to nature conservation, for instance the Colwell Bay SSSI would maintain important geological exposures and the Solent Maritime SAC may benefit from an increased availability of sediment.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	Defences are likely to offer continued protection to heritage assets until the end of the first epoch.	Loss of heritage assets including the full/partial loss of Fort Albert.	Loss of heritage assets including the full/partial loss of Fort Albert.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	Landscape is unlikely to be affected within the first epoch.	The loss of heritage features is likely to adversely impact upon the historic landscape of the area.	The loss of heritage features is likely to adversely impact upon the historic landscape of the area.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.	Maintained coastal access and the assurance of health and safety compliance are likely to have a beneficial impact in the first epoch.	Maintained coastal access, assurance of health and safety compliance and the development of a CCMA are likely to have a beneficial impact in the second epoch.	Health and safety compliance and the implementation of a CCMA are likely to have a beneficial impact in the third epoch, although properties will be at risk, especially in the longer term.
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	Effects on material assets are likely to be neutral.	The CCMA facilitates the protection of material assets in the future by preventing inappropriate development.	The CCMA facilitates the protection of material assets in the future by preventing inappropriate development.
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants	Under a 'Do Minimum' scenario there may be additional landslides which may impact upon the integrity of geology and soils.	Under a 'Do Minimum' scenario there may be additional landslides which may impact upon the integrity of geology and soils.	Under a 'Do Minimum' scenario there may be additional landslides which may impact upon the integrity of geology and soils.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.			
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation; - There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.	There is unlikely to be any impacts upon water quality through the delivery of this scenario.	There is unlikely to be any impacts upon water quality through the delivery of this scenario.	There is unlikely to be any impacts upon water quality through the delivery of this scenario.

20.3 SMZ3a: Yarmouth Area **(Fort Victoria across Yarmouth to Port la Salle)**

Preferred Strategy Option: ***Maintain (and Temporary Flood Barriers) then Improve from 2055 –*** *Use Temporary Flood Barriers to manage and reduce flooding to areas at significant risk by sustaining a 1 in 75 year (1.33% AEP) standard of protection. Prevent erosion to critical infrastructure serving the town and the West Wight. From 2055, if funding can be secured, raise / implement ne defences (bunds and seawalls) to manage long term increase in flood and erosion risk posed by sea level rise.*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	Maintenance would prevent the migration and breach of designated SAC features. However in some areas natural processes would become constrained. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	Maintenance would prevent the migration and breach of designated SAC features. However in some areas natural processes would become constrained.	Maintenance would prevent the migration and breach of designated SAC features. However in some areas natural processes would become constrained.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	Privately funded maintenance of existing defence is permitted and therefore it is anticipated that there will be some minor beneficial impacts in regards to heritage – i.e. mitigating or delaying loss at Fort Victoria. Elsewhere, a temporary flood barrier provides some protection to the historic and cultural character of the area.	Privately funded maintenance of existing defence is permitted and therefore it is anticipated that there will be some minor beneficial impacts in regards to heritage – i.e. mitigating or delaying loss at Fort Victoria. Elsewhere, a temporary flood barrier provides some protection to the historic and cultural character of the area.	Privately funded maintenance of existing defence is permitted and therefore it is anticipated that there will be some minor beneficial impacts in regards to heritage – i.e. mitigating or delaying loss at Fort Victoria. Long-term defence improvements proposed in most areas will continue protection to assets such as Yarmouth Castle.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and,	Privately funded maintenance of existing defences is permitted and provision of temporary flood barriers and therefore the historic landscape in key locations could be preserved.	Privately funded maintenance of existing defences is permitted and provision of temporary flood barriers and therefore the historic landscape in key locations could be preserved.	Privately funded maintenance of existing defences and long-term defence improvements proposed in most areas is permitted and therefore the historic landscape in key locations could be preserved.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	- Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.			
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.	Maintenance and implementation of Temporary Flood Barriers are likely to have a beneficial impact across each epoch. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	Maintenance and implementation of Temporary Flood Barriers are likely to have a beneficial impact across each epoch. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	The raising/implementation of new defences (bunds and floodwalls) to manage longer-term flood and erosion risk will majorly benefit the material assets within this area and subsequently offer significant benefits to human health.
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have	Maintenance of existing defences and the breakwater along with the implementation of the temporary flood barriers and a setback defence will protect material assets in epoch one.	Maintenance of existing defences and the breakwater along with the implementation of the temporary flood barriers and defence refurbishment will protect material assets in epoch two.	The raising/implementation of new defences (bunds and floodwalls) to manage longer-term flood and erosion risk will majorly benefit the material assets within this area.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.			
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	Geology and soil is not likely to be affected.	Geology and soil is not likely to be affected.	Geology and soil is not likely to be affected.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation; - There are numerous incidents of historic	The prevention of salt water intrusion in areas such as Thorley Brook is likely to maintain water quality. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.	The prevention of salt water intrusion in areas such as Thorley Brook from the north is likely to maintain water quality Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.	The prevention of salt water intrusion in areas such as Thorley Brook from the north is likely to maintain water quality Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			

20.4 SMZ3b: Yar Estuary

Preferred Strategy Option: ***Do Minimum (and PLP) with Managed Realignment between 2025 and 2055 –*** *Maintain existing structures, H&S and cycle and footpath access. If funding can be secured, managed realignment at Thorley Brook between 2025 and 2055 to provide environmental mitigation and create intertidal habitat. Recommend Property Level Protection for the few residential properties at very significant flood risk.*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	There is potential for significant change in regards to nature conservation, the direction of which remains unknown without further assessment. For instance, saltmarsh within the estuary is likely to be sensitive to future climate change and sea-level rise unless vertical accretion can compensate under a 'Do Nothing' scenario. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	The preferred option recommends a managed realignment scheme at Thorley Brook which is likely to produce significant nature conservation benefits.	The preferred option recommends a managed realignment scheme at Thorley Brook which is likely to produce significant nature conservation benefits.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	Minor private maintenance is likely to protect heritage assets in the area that may otherwise be at risk.	Minor private maintenance is likely to protect heritage assets in the area that may otherwise be at risk.	Minor private maintenance is likely to protect heritage assets in the area that may otherwise be at risk.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	Minor maintenance will not impact upon the core objectives of the Estuary in regards to nature conservation and will support the landscape value and the AONB designation	Adaptation will support the core objectives of the Estuary in regards to nature conservation and will support the landscape value and the AONB designation	Adaptation will support the core objectives of the Estuary in regards to nature conservation and will support the landscape value and the AONB designation

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.	Significant human health benefits will be derived from reduced flood risks by undertaking PLP measures. However there may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	Significant human health benefits will be derived from reduced flood risks by undertaking PLP measures. However there may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	Significant human health benefits will be derived from reduced flood risks by undertaking PLP measures. However there may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	Maintenance of defences during epoch one would benefit material assets during this time period. Property level protection measures likely to improve the resilience against flooding of the assets most at risk.	Property level protection measures likely to improve the resilience against flooding of the assets most at risk.	Property level protection measures likely to improve the resilience against flooding of the assets most at risk.
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	Geology and Soil is unlikely to be affected across this SMZ as a result of the implementation of the preferred option.	Geology and Soil is unlikely to be affected across this SMZ as a result of the implementation of the preferred option.	Geology and Soil is unlikely to be affected across this SMZ as a result of the implementation of the preferred option.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation; - There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.	There are unlikely to be any impacts upon water quality through the delivery of this scenario. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.	There is unlikely to be any impacts upon water quality through the delivery of this scenario. Overall affects are neutral.	There is unlikely to be any impacts upon water quality through the delivery of this scenario. Overall affects are neutral.

20.5 SMZ 3C: The Causeway and Freshwater Bay

Preferred Strategy Option: ***Maintain (and PLP) then Improve 2055)*** *– Maintenance of existing structures and recommend Property Level Protection to the residential properties at significant flood risk. Refurbishment of existing defences at Freshwater Bay at end of design life to prevent erosion risk and implement new defences at Freshwater Village to mitigate flood risk and improve the standard of protection.*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	The maintenance of defences will prevent the breach of flood defences and therefore prevent tidal inundation of habitats upstream. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	The maintenance / refurbishment of defences will prevent the breach of flood defences and therefore prevent tidal inundation of habitats upstream. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	The maintenance / refurbishment of defences will prevent the breach of flood defences and therefore prevent tidal inundation of habitats upstream. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	Heritage features (such as the causeway itself, WWII pillbox and All Saints Church) are likely to remain protected and therefore the landscape of this area will be preserved	Heritage features (such as the causeway itself, WWII pillbox and All Saints Church) are likely to remain protected and therefore the landscape of this area will be preserved	Heritage features (such as the causeway itself, WWII pillbox and All Saints Church) are likely to remain protected and therefore the landscape of this area will be preserved
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	Neutral impacts on landscape.	Neutral impacts on landscape.	Neutral impacts on landscape.
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding can have immediate impacts upon human health	Maintenance of existing defences and PLP works are likely to provide human health benefits. Residual flood risk may lead to temporary, minor adverse impacts on human health due to the temporary deterioration in water quality resulting from pollution (i.e. flooding to agricultural and sewage treatment works). Overall affects are positive.	Maintenance of existing defences and PLP works are likely to provide human health benefits. Residual flood risk may lead to temporary, minor adverse impacts on human health due to the temporary deterioration in water quality resulting from pollution (i.e. flooding to agricultural and sewage treatment works). Overall affects are positive.	Due to the improvement works recommended by this scenario, the SoP offered to areas such as Freshwater Village are likely to provide major benefits and subsequently human health benefits are anticipated. Residual flood risk may lead to temporary, minor adverse impacts on human health due to the temporary deterioration in water quality resulting from pollution (i.e. flooding to agricultural and sewage treatment works). Overall affects are positive.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.			
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	The maintenance works recommended under the preferred option would significantly reduce flood risk to a wide range of material assets across this SMZ including major transport links and properties.	The maintenance and refurbishment works recommended under the preferred option would significantly reduce flood risk to a wide range of material assets across this SMZ including major transport links and properties.	The improvement and refurbishment works recommended under the preferred option would significantly reduce flood risk to a wide range of material assets across this SMZ including major transport links and properties.
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	Geology and Soil is unlikely to be affected across this SMZ as a result of the implementation of the preferred option.	Geology and Soil is unlikely to be affected across this SMZ as a result of the implementation of the preferred option.	Geology and Soil is unlikely to be affected across this SMZ as a result of the implementation of the preferred option.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation;	Water quality is unlikely to be affected across this SMZ as a result of the implementation of the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.	Water quality is unlikely to be affected across this SMZ as a result of the implementation of the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.	Water quality is unlikely to be affected across this SMZ as a result of the implementation of the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	- There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			

20.6 SMZ4: Newtown Coast

Preferred Strategy Option: ***Do Nothing*** *– No Active Intervention. Baseline scenario.*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	Allows for a natural evolution of nature conservation interest, and will ensure a continued sediment source and transport pathways. Adverse impacts are possible such as the inundation of saltmarsh.	Allows for a natural evolution of nature conservation interest, and will ensure a continued sediment source and transport pathways. Adverse impacts are possible such as the inundation of saltmarsh.	Allows for a natural evolution of nature conservation interest, and will ensure a continued sediment source and transport pathways. In the long term there is potential for gain of saltmarsh and intertidal flats (which support international nature conservation designations) as the coast is allowed to roll back.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	During the first time epoch the flood risk to Heritage / Historic assets is not considered to be significant and therefore No Active Intervention is not likely produce impacts during this period.	A ‘Do Nothing’ scenario will fail to prevent flooding of part of a Scheduled Monument (the remains of the medieval town of Newtown) and widespread exposure and loss of intertidal archaeological resources such as palaeoenvironmental deposits at the mouth of the estuary. Brickfields farmhouse on the eastern spit will be lost to erosion.	A ‘Do Nothing’ scenario will fail to prevent flooding of part of a Scheduled Monument (the remains of the medieval town of Newtown) and widespread exposure and loss of intertidal archaeological resources such as palaeoenvironmental deposits at the mouth of the estuary. Brickfields farmhouse on the eastern spit will be lost to erosion.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight’s Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	The natural evolution of nature conservation interests along this frontage and the continued sediment source and transport pathway will improve landscape character and support the AONB features.	The natural evolution of nature conservation interests along this frontage and the continued sediment source and transport pathway will improve landscape character and support the AONB features.	The natural evolution of nature conservation interests along this frontage and the continued sediment source and transport pathway will improve landscape character and support the AONB features.
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints ‘post-flood’ such as	As a result of the potential risk to several properties near Cranmore, Thorness Bay holiday park, Thorness and Gurnard Luck, along with the increased risk of landslides, there are a number of potential risks to human health.	As a result of the potential risk to several properties near Cranmore, Thorness Bay holiday park, Thorness and Gurnard Luck, along with the increased risk of landslides, there are a number of potential risks to human health.	As a result of the potential risk to several properties near Cranmore, Thorness Bay holiday park, Thorness and Gurnard Luck, along with the increased risk of landslides, there are a number of potential risks to human health.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	stress and anxiety; and, - Flooding can limit access to healthcare.			
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	As above.	As above.	As above.
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	Geology and soil may be adversely affected with the erosion of the cliff toe and cliff foot debris triggering mudslides, transitional slides, and infrequent deep-seated rotational slides.	Geology and soil may be adversely affected with the erosion of the cliff toe and cliff foot debris triggering mudslides, transitional slides, and infrequent deep-seated rotational slides.	Geology and soil may be adversely affected with the erosion of the cliff toe and cliff foot debris triggering mudslides, transitional slides, and infrequent deep-seated rotational slides.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation;	Water quality is unlikely to be affected.	Water quality is unlikely to be affected.	Water quality is unlikely to be affected.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	- There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			

20.7 SMZ5a: Gurnard Luck and Gurnard Cliff

Preferred Strategy Option: ***Do Minimum and Resilience the Adapt –*** The preferred approach for the first two time epochs of the Strategy is to Do Minimum, with community and property level resilience and adaption. Privately funded maintenance of existing assets will be permitted (subject to the normal consents). In the future the IoW council will work with communities to develop and implement a Coastal Change Management to adapt to increasing risks posed by climate change. Do minimum (maintain H&S) at Gurnard Cliff.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	Neutral impact on biodiversity during the first epoch. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	The collapse of defences and flooding of marsh areas will result in the creation of intertidal mudflats and saltmarsh in the medium to long-term. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	The collapse of defences and flooding of marsh areas will result in the creation of intertidal mudflats and saltmarsh in the medium to long-term. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	There is unlikely to be any impacts upon cultural heritage and the historic environment under the preferred scenario.	There is unlikely to be any impacts upon cultural heritage and the historic environment under the preferred scenario.	There is unlikely to be any impacts upon cultural heritage and the historic environment under the preferred scenario.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	There is unlikely to be any impacts upon landscape under the preferred scenario.	There is unlikely to be any impacts upon landscape under the preferred scenario.	There is unlikely to be any impacts upon landscape under the preferred scenario.
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change	Minor benefits to human health are anticipated as a result of health and safety measures, recommended PLP measures and the implementation of a CCMA. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.	Minor benefits to human health are anticipated as a result of health and safety measures recommended PLP, and the implementation of a CCMA. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.	Minor benefits to human health are anticipated as a result of health and safety measures recommended adaptation and the implementation of a CCMA. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.			
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	The recommended PLP measures will protect material assets internally whereas the development and implementation of a CCMA is likely to offer protection to material assets in the future.	Adaptation by the community and the continuation of recommended PLP measures could protect material assets internally whilst development and implementation of a CCMA can protect future material assets by preventing inappropriate development.	The CCMA facilitates the protection of material assets in the future by preventing inappropriate development.
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	There is unlikely to be any impacts upon geology and soils under the preferred option.	There is unlikely to be any impacts upon geology and soils under the preferred option.	There is unlikely to be any impacts upon geology and soils under the preferred option.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for	There is unlikely to be any impacts upon water under the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.	There is unlikely to be any impacts upon water under the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.	There is unlikely to be any impacts upon water under the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	licensing yet these areas typically lie in areas of nature conservation designation; - There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			

20.8 SMZ5b: Gurnard to Cowes Parade

Preferred Strategy Option: ***Maintain*** *– Maintenance of existing structures and refurbishment or replacement at end of their residual life to reduce risks of erosion and landslide reactivation. Flood risk will increase due to sea level rise.*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	Impacts on nature conservation are anticipated to be neutral.	Impacts on nature conservation are anticipated to be neutral.	Impacts on nature conservation are anticipated to be neutral.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	Erosion protection measures will help protect the historic environment of Cowes waterfront alongside a number of listed buildings. However, the flood risk to these features / assets will persist and increase in the future under sea level rise. Overall, measures likely to lead to a positive impact.	Erosion protection measures will help protect the historic environment of Cowes waterfront alongside a number of listed buildings. However, the flood risk to these features / assets will persist and increase in the future under sea level rise. Overall, measures likely to lead to a positive impact.	Erosion protection measures will help protect the historic environment of Cowes waterfront alongside a number of listed buildings. However, the flood risk to these features / assets will persist and increase in the future under sea level rise. Overall, measures likely to lead to a positive impact.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	Impacts on the landscape value of the area will be neutral.	Impacts on the landscape value of the area will be neutral.	Impacts on the landscape value of the area will be neutral.
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as	Human health will benefit significantly from a large number of properties being defended against erosion and landslide activation. However, human health risks will remain due to flood risk which is expected to increase in the future. Overall, measures likely to lead to a positive impact.	Human health will benefit significantly from a large number of properties being defended against erosion and landslide activation. However, human health risks will remain due to flood risk which is expected to increase in the future. Overall, measures likely to lead to a positive impact.	Human health will benefit significantly from a large number of properties being defended against erosion and landslide activation. However, human health risks will remain due to flood risk which is expected to increase in the future. Overall, measures likely to lead to a positive impact.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	stress and anxiety; and, - Flooding can limit access to healthcare.			
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	A significant number of material assets will be protected from risk associated with erosion and landslide activation. However, a number of assets will remain at risk from flooding, with the risk expected to increase in the future due to climate change. Overall, measures are likely to leave a positive impact.	A significant number of material assets will be protected from risk associated with erosion and landslide activation. However, a number of assets will remain at risk from flooding, with the risk expected to increase in the future due to climate change. Overall, measures are likely to leave a positive impact.	A significant number of material assets will be protected from risk associated with erosion and landslide activation. However, a number of assets will remain at risk from flooding, with the risk expected to increase in the future due to climate change. Overall, measures are likely to leave a positive impact.
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	Maintenance of seawalls will significantly reduce the risk of landslide reactivation by continuing to prevent coastal slope toe erosion and undermining.	Maintenance of seawalls will significantly reduce the risk of landslide reactivation by continuing to prevent coastal slope toe erosion and undermining.	Maintenance of seawalls will significantly reduce the risk of landslide reactivation by continuing to prevent coastal slope toe erosion and undermining.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation;	There is unlikely to be any impacts upon water under the preferred option.	There is unlikely to be any impacts upon water under the preferred option.	There is unlikely to be any impacts upon water under the preferred option.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	- There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			

20.9 SMZ6a: Cowes and East Cowes

Preferred Strategy Option: ***Sustain (with Temporary Flood Barriers and PLP) then Improve from 2055 –*** *In the short and medium term maintain the existing defences and use Temporary Flood Barriers and Property Level Protection to sustain a 1 in 75 year (1.33% AEP) standard of protection in the areas at significant flood risk. Use redevelopment opportunities to facilitate the raising / implementation of new strategic defences. In the long term (from 2055), if the funding can be secured, implement new defences such as seawalls or setback floodwalls to manage the increase in flood and erosion risk posed by sea level rise.*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	Maintenance of existing defences could help prevent erosion of made ground and release of potential contaminants / sewage into the water body which would otherwise impact biodiversity. However, works to maintain frontline defences may act as a constraint to the natural evolution of conservation interests. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	Maintenance of existing defences could help prevent erosion of made ground and release of potential contaminants / sewage into the water body which would otherwise impact biodiversity. However, works to maintain frontline defences may act as a constraint to the natural evolution of conservation interests. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	Implementation of new defences could help prevent erosion of made ground and release of potential contaminants / sewage into the water body which would otherwise impact biodiversity. However, new defence works (i.e. sheet-piling) may act as a constraint to the natural evolution of conservation interests. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	A number of listed buildings would be protected under the preferred option.	A number of listed buildings would be protected under the preferred option.	A number of listed buildings would be protected under the preferred option.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	As a result of the protection offered to biodiversity, heritage and material assets, the iconic landscape of the estuary will be maintained. However, the presence of sheet-piling may have adverse implications for landscape character and features.	As a result of the protection offered to biodiversity, heritage and material assets, the iconic landscape of the estuary will be maintained. However, the presence of sheet-piling may have adverse implications for landscape character and features.	As a result of the protection offered to biodiversity, heritage and material assets, the iconic landscape of the estuary will be maintained. However, the presence of sheet-piling may have adverse implications for landscape character and features.
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change	By sustaining the SoP through the use of temporary flood barriers, properties and subsequently people will be protected, with PLP acting as a final measure to ensure safety. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.	By sustaining the SoP through the use of temporary flood barriers, properties and subsequently people will be protected, with PLP acting as a final measure to ensure safety. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.	The improvement in SoP will significantly benefit human health though reducing flood risk.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.			
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	By sustaining the SoP through the use of temporary flood barriers, material assets will benefit from reduced flood risk.	By sustaining the SoP through the use of temporary flood barriers, material assets will benefit from reduced flood risk.	By improving the SoP, a number of material assets will significantly benefit from a reduced flood risk
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	There is unlikely to be any impacts upon geology and soils under the preferred option.	There is unlikely to be any impacts upon geology and soils under the preferred option.	There is unlikely to be any impacts upon geology and soils under the preferred option.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature	There is unlikely to be any impacts upon water under the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.	There is unlikely to be any impacts upon water under the preferred option.	There is unlikely to be any impacts upon water under the preferred option.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	conservation designation; - There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			

20.10 SMZ6b: River Medina (excluding Cowes, East Cowes and Newport) and Shrape Breakwater to Old Castle Point

Preferred Strategy Option: ***Do Nothing*** *– No active intervention. Baseline scenario*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	There is unlikely to be any change to biodiversity and nature conservation during epoch one. Waterside development area and the marina currently present would impede natural change prior to defence failure.	The central sections of the estuary will evolve naturally. However, natural roll back is constrained. Overall impacts are likely to be minor yet beneficial.	The central sections of the estuary will evolve naturally. However, natural roll back is constrained. Overall impacts are likely to be minor yet beneficial.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	Unlikely to be any impacts on the Cultural Heritage / Historic Environment of the area.	Unlikely to be any impacts on the Cultural Heritage / Historic Environment of the area.	Unlikely to be any impacts on the Cultural Heritage / Historic Environment of the area.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	There are unlikely to be any impacts upon the landscape character of the area.	There are unlikely to be any impacts upon the landscape character of the area.	There are unlikely to be any impacts upon the landscape character of the area.
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change and its associated impacts including flooding; - Flooding can have immediate impacts upon human health	Health is unlikely to be affected by a 'Do Nothing' scenario.	Health is unlikely to be affected by a 'Do Nothing' scenario.	Health is unlikely to be affected by a 'Do Nothing' scenario.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.			
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	Potential flooding to a number of (mainly isolated) properties, infrastructure and commercial operations of the estuary.	Flooding is expected to a number of (mainly isolated) properties, infrastructure and commercial operations (of the estuary.	Flooding/erosion risk to a number of (mainly isolated) properties, infrastructure and commercial operations of the estuary.
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	There is unlikely to be any impacts upon geology and soils under the preferred option.	There is unlikely to be any impacts upon geology and soils under the preferred option.	There is unlikely to be any impacts upon geology and soils under the preferred option.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature conservation designation;	There is unlikely to be any impacts upon water under the preferred option.	There is unlikely to be any impacts upon water under the preferred option.	There is unlikely to be any impacts upon water under the preferred option.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	- There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			

20.11 SMZ6c: Newport

Preferred Strategy Option: ***Maintain (and PLP) then Improve from 2055 (through redevelopment) –*** *In the short term recommend Property Level Protection to manage and reduce flooding to the few residential properties at very significant risk. Maintain then refurbish existing defences once they reach the end of their service life. In the long term use redevelopment opportunities to facilitate the raising / implementation of new strategic defences to improve the standard of flood protection.*

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
Biodiversity	- There are a number of sites designated for their nature conservation importance within the Strategy area, including internationally, nationally and locally designated nature conservation sites; - The condition and integrity of these sites must not be compromised and where possible efforts should be made to enhance these sites such as through habitat creation; - It must be ensured that coastal developments avoid disruption of coastal or other natural processes that might lead to the loss of coastal and estuarine habitat, including mudflats and saltmarsh, which support a variety of nationally rare and scarce species; - There are a number of threats to the integrity of intertidal habitats such as *Spartina* dieback, development pressures leading to coastal squeeze etc.; and, - These threats will be exacerbated by climate change.	Impacts on biodiversity are likely to be minor as there is only space for marginal roll-back of intertidal habitats as a result of the relatively steep topography of the river. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	Impacts on biodiversity are likely to be minor as there is only space for marginal roll-back of intertidal habitats as a result of the relatively steep topography of the river. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.	Impacts on biodiversity are likely to be minor as there is only space for marginal roll-back of intertidal habitats as a result of the relatively steep topography of the river. There may be temporary, minor adverse impacts on biodiversity due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks.
Cultural Heritage/ Historic Environment	- There are a number of international, national and local legislative frameworks, strategies, policies and plans which seek to protect and enhance cultural heritage throughout the Isle of Wight; - There are a number of heritage assets along the West Wight coastal stretch some of which feature on the Heritage at Risk Register; - These assets must be protected and where possible enhanced in order to maintain their integrity and importance; and, - There are a number of potential future pressures on heritage assets such as coastal squeeze, sea-level rise and development pressures.	A number of listed buildings will be protected under the preferred option.	A number of listed buildings will be protected under the preferred option.	A number of listed buildings will be protected under the preferred option.
Landscape	- There are a number of international, national and local legislative frameworks and policy which seek to protect and enhance the landscape and green infrastructure assets of the Isle of Wight; - The Isle of Wight and the study site in particular have a very varied landscape comprising multiple land uses; - The majority of the study site is covered by AONB designations and the isle of Wight's Heritage Coastline; - The study site comprises a landscape improvement zone which requires mitigation and could be subject to further pressures from new development on the outskirts of urbanised areas; and, - Development pressures on other areas bar the landscape improvement zones could also alter the landscape character of the Isle of Wight either adversely or beneficially and sympathetic design will need to be utilised where appropriate.	Due to the perseveration of the historic environment, the landscape value of the Newport Quayside will be retained.	Due to the perseveration of the historic environment, the landscape value of the Newport Quayside will be retained.	Due to the perseveration of the historic environment, the landscape value of the Newport Quayside will be retained.
Health	- Access to the natural environment is essential to protect and enhance human health and wellbeing (yet can pose threats) as highlighted by the Millennium and National Ecosystem Assessment; - Generally, health and wellbeing on the Isle of Wight is less favourable than the national average however there are inequalities amongst subsets of the population; - Local policies and plans aim to improve the health and wellbeing of Isle of Wight residents; - Health could improve in line with these strategies but will face further challenges from external factors such as climate change	As a result of the protection offered to material assets, significant benefits in regards to human health are expected. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.	As a result of the protection offered to material assets, significant benefits in regards to human health are expected. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.	As a result of the protection offered to material assets, significant benefits in regards to human health are expected. There may be temporary, minor adverse impacts on human health due to the temporary deterioration in water quality as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are positive.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	and its associated impacts including flooding; - Flooding can have immediate impacts upon human health and/or can result in health complaints 'post-flood' such as stress and anxiety; and, - Flooding can limit access to healthcare.			
Material Assets	- There are a number of national and local plans, policies and strategies which relate to the protection and enhancement of material assets in relation to flood and water management; - Such documents including the Isle of Wight Core Strategy include numerous environmental objective related to material asset provision and enhancement; - West Wight comprises a number of settlements of varying size connected by a transport network inclusive of the A3020 and the A3055. - Key transport links in the Strategy area are the three cross-Solent ferry terminals at Yarmouth, West Cowes and East Cowes, and also the Floating Bridge linking Cowes and East Cowes; - Alongside residential areas, West Wight also comprises industrial and commercial land uses and more rural areas and agricultural land; - Coastal flooding poses a threat to West Wight material assets and as such there are a number of defended areas along the project frontage such as seawalls, groynes and gabions; - However a number of these defences are shown to be in poor condition and have been subject to failure in recent years; and, - As a result of overtopping and breach, these coastal defences will require future management.	With continuing maintenance, a number of properties will be defended against flooding. Despite this, regular inundation of significant areas of Newport Harbour is likely as the majority of defence levels are likely to be insufficient as they were not designed to protect against the prevailing conditions on a 50-100 year timescale nor do they provide a continuous defence line. Whilst PLP will offer additional protection in tandem with maintenance, residual risks will remain to material assets and human health	With continuing maintenance and upgrades through development, a number of properties will be defended against flooding. Despite this, regular inundation of significant areas of Newport Harbour is likely as the majority of defence levels are likely to be insufficient as they were not designed to protect against the prevailing conditions on a 50-100 year timescale nor do they provide a continuous defence line. Whilst PLP will offer additional protection in tandem with maintenance, residual risks will remain to material assets and human health	With continuing maintenance and upgrades through development, a number of properties will be defended against flooding. Despite this, regular inundation of significant areas of Newport Harbour is likely as the majority of defence levels are likely to be insufficient as they were not designed to protect against the prevailing conditions on a 50-100 year timescale nor do they provide a continuous defence line. Whilst PLP will offer additional protection in tandem with maintenance, residual risks will remain to material assets and human health
Soil	- There are a number of national and local level policies which promote the protection and enhancement of geology and soils inclusive of those which relate to contaminated land; - The Isle of Wight is highly diverse geologically; - The majority of the project frontage lies upon Paleogene geology known as the 'Solent Group' which comprises clay, silt and sand; - Smaller areas at the most southern extent of the study area lie on Cretaceous Chalk geology; - There are a number of superficial deposits which overlie bedrock geology and these include: alluvium, brickearth, raised marine deposits, river terrace deposits, sand and gravel of unknown origin and landslide deposits; - Climate change is likely to have complex impacts upon soil assets and may influence soil quality through erosion and/or the mobilisation of pollutants as a result of extreme weather events such as flooding; and, - Climate change may impact geology as a result of coastal erosion as a function of sea-level rise which may reduce geodiversity and subsequently impact upon associated heritage.	There is unlikely to be any impacts upon geology and soils under the preferred option.	There is unlikely to be any impacts upon geology and soils under the preferred option.	There is unlikely to be any impacts upon geology and soils under the preferred option.
Water	- There is a wide range of international, national, regional and local policy which aims to protect and enhance water resources and the environment; - Sea level rise of up to 0.752m by 2115 is projected; - The water quality of the four WFD waterbodies in West Wight is considered to be of moderate status/potential as a result of high nutrient quantities; - There are four designated bathing waters all of which achieved the 'higher'; standard as outlined in the Bathing Water Directive; - Water resources face numerous pressures with 25% of the island's water demand being supplied from the mainland; - There are areas of the West Wight where water is available for licensing yet these areas typically lie in areas of nature	There is unlikely to be any impact upon water under the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.	There is unlikely to be any impact upon water under the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.	There is unlikely to be any impact upon water under the preferred option. Water quality may be temporarily affected as a result of pollution (agricultural and sewage treatment works) arising from residual flood risks. Overall affects are neutral.

SEA Topic	Key Environmental Issue	2015 - 2025	2025-2055	2055-2115
	conservation designation; - There are numerous incidents of historic flooding in areas such as Western Yar, Freshwater and East Cowes, a number of flood incident reports have been produced in response to these events; - There are a number of other sources of flooding beyond tidal and fluvial flooding such as the surface water flooding experienced in Western Yar; - Standard Percentage Runoff of soils is estimated to be 47% therefore runoff potential in the area is likely to be high and may therefore contribute to surface water flooding; - Similarly, the infiltration potential of soils is considered to be low; and, - Due to high runoff and low soil leaching potentials in much of West Wight, infiltration SuDS techniques may be unsuitable and therefore additional mitigation methods will have to be explored and incorporated to prevent increased flood risk on and off-site.			